

**REPORT OF
AIR POLLUTION SOURCE TESTING
OF AN ETHYLENE OXIDE EMISSION-CONTROL SYSTEM
OPERATED BY STERIGENICS, INC.
IN ONTARIO, CALIFORNIA
ON OCTOBER 13, 2015**

Submitted to:

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 East Copley Drive
Diamond Bar, California 91765-4182**

Submitted by:

**STERIGENICS, INC.
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SCAQMD Facility ID 126060

Prepared by:

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November 8, 2015

ECSi

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SCAQMD Permit Number F96410 (Catalytic Oxidizer)

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TEST DATE

Tuesday, October 13, 2015

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1.0 INTRODUCTION

On Tuesday, October 13, 2015, ECSi, Inc. performed annual air pollution source testing and semi-annual leak testing of an ethylene oxide (EtO) sterilization and emission-control system operated by Sterigenics, Inc. in Ontario, California. The control device tested included one Donaldson Abator catalytic oxidizer, which is currently used to control emissions from eight commercial ethylene oxide sterilizer backvents, and one aeration room. The purpose of the testing program was to evaluate continued compliance with South Coast Air Quality Management District (SCAQMD) Rule 1405, the conditions established in the permit (F96410) granted to Sterigenics, Inc. by the SCAQMD, and with the work practice provisions in 40 CFR 63.363(b)(4)(i).

2.0 EQUIPMENT

The EtO gas-sterilization system is comprised of eight commercial sterilizers, all discharging through liquid-ring vacuum pumps to an existing packed-tower acid scrubber emission control device. The sterilization chamber backvents for all chambers discharge to the aeration room, which discharges to a Donaldson EtO Abator catalytic oxidizer emission-control device. The gas-sterilization and emission-control equipment consists of the following:

- Six identical Trumbo/Xytel Gas Sterilizers, each comprised of a heated 2460 cubic foot interior volume sterilization chamber, a recirculating vacuum pump chamber evacuation system, and a backvent valve
- Two identical Trumbo/Xytel Gas Sterilizers, each comprised of a heated 5300 cubic foot interior volume sterilization chamber, a recirculating vacuum pump chamber evacuation system, a backvent valve, and a fugitive emissions exhaust hood
- One aeration room, comprised of a heated aeration chamber and a chamber exhaust/vent system.

Sterilizer vacuum pump emissions are controlled by:

- One Ceilcote packed tower chemical scrubber, Model SPT-48-168, 4'-0" diameter and 23'-4" high, equipped with a 14' deep bed of No. 1 Tellerette packing, a 5000 gallon reaction tank with two 10 hp/151 gpm recirculating pumps (one standby), and a 3 hp/2000 cfm exhaust fan.

Sterilizer backvent and aeration emissions are controlled by:

- One Donaldson EtO Abator System, 25,000 SCFM, equipped with a prefilter, a gas-fired heater, an exhaust gas heat exchanger, a reactive catalyst bed, and an exhaust blower.

3.0 TESTING

EtO source testing was conducted in accordance with the procedures outlined in CARB Method 431 and USEPA CFR40, Part 63.365. EtO emissions monitoring was conducted simultaneously at the inlet and outlet of the Abator during the entire backvent duration of one of the eight sterilizers, and during three one-hour time intervals of the aeration process.

During backvent/aeration testing, EtO emissions at the inlet and the outlet of the catalytic oxidizer were determined using direct source sample injection into the gas chromatograph (GC). All backvent and aeration testing was performed using freshly sterilized product.

4.0 RULE/COMPLIANCE REQUIREMENTS

The EtO gas-sterilization system at Sterigenics, Inc. was tested to evaluate compliance with the conditions specified in the SCAQMD Permit, and with the requirements outlined in SCAQMD Rule 1405. The current testing was performed to demonstrate continued compliance with the following requirements:

- The backvent valve discharge stream must be vented to control equipment with an EtO emission-reduction efficiency of at least 99.0% by weight;
- The aeration discharge stream must be vented to control equipment with an EtO emission-reduction efficiency of at least 99.0% by weight;

Testing is required to demonstrate compliance with these requirements. Source testing of the emission-control device is required initially, and is required annually thereafter.

5.0 TEST METHOD REFERENCE

5.1 INTRODUCTION

EtO source testing was conducted in accordance with the procedures outlined in CARB Method 431 and USEPA CFR40, Part 63.365. EtO emissions monitoring was conducted simultaneously at the inlet and outlet of the Abator during the entire backvent duration of one of the eight sterilizers, and during three one-hour time intervals of the aeration process.

During backvent/aeration testing, EtO emissions at the inlet and the outlet of the catalytic oxidizer were determined using direct source sample injection into the gas chromatograph (GC). All backvent and aeration testing was performed using freshly sterilized product.

Operation and documentation of process conditions were performed by personnel from Sterigenics, Inc. using existing monitoring instruments installed by the manufacturer of the equipment to be tested. In accordance with SCAQMD requirements, and the procedures established in USEPA CFR40, Part 63, Subpart O, catalyst bed operating temperature was recorded, and is presented in Tables 1 and 2.

5.2 VOLUMETRIC FLOW MEASUREMENT

Exhaust gas flow at the outlet of the Abator was determined by EPA Method 2C using a standard pitot tube and an inclined-oil manometer. Sampling ports were installed in accordance with EPA Method 1, and are located far enough from any flow disturbances to permit accurate flow measurement.

Temperature measurements were obtained from a type K thermocouple and thermometer attached to the sampling probe. Exhaust gas composition was assumed to be air and small amounts of water vapor. Water vapor was negligible, at about 3 percent.

5.3 CONTROL EFFICIENCY AND MASS EMISSIONS MEASUREMENT

During backvent and aeration testing, EtO emissions at the inlet and outlet of the catalytic oxidizer were determined using direct source sample injection into the GC. The mass of EtO emitted to the inlet and from the outlet were determined using the equation shown below in Section 5.9. Mass-mass control-efficiency of EtO during the backvent and aeration phases was calculated by comparing the mass of EtO vented to the system inlet to the mass of EtO vented from the system outlet.

During the backvent and aeration phases, vented gas was analyzed by an SRI, Model 8610, portable gas chromatograph (GC), equipped with the following: dual, heated sample loops and injectors; dual columns; and dual detectors. A flame ionization detector (FID) was used to quantify inlet EtO emissions, and a photoionization detector (PID) was used to quantify low-level EtO emissions at the emission-control device outlet.

5.4 SAMPLE TRANSPORT

Source gas was pumped to the GC at approximately 500-1000 cubic centimeters per minute (cc/min) from the sampling ports through two lengths of Teflon[®] sample line, each with a nominal volume of approximately 75 cubic centimeters (cc) and an outer diameter of 0.25 inch. At the inlet of the catalytic oxidizer, the sampling port was located in the common backvent/aeration discharge duct, upstream of the oxidizer. At the outlet of the catalytic oxidizer, sampling ports were located in the exhaust stack downstream of the catalyst bed.

5.5 GC INJECTION

Source-gas samples were injected into the GC which was equipped with two heated sampling loops, each containing a volume of approximately 2cc and maintained at 100 degrees Celsius (C). Injections occurred at approximately one-minute intervals during backvent testing, and at approximately five-minute intervals during aeration testing. Helium was the carrier gas for both the FID and PID.

5.6 GC CONDITIONS

The packed columns for the GC were operated at 80 degrees C. The columns were stainless steel, 6 feet long, 0.125 inch outer diameter, packed with 1 percent SP-1000 on 60/80 mesh Carbopack B.

During the analysis, the FID was operated at 250 degrees C. The support gases for the FID were hydrogen (99.995% pure) and air (99.9999% pure). Any unused sample gas was vented from the GC system back to the inlet of the control device being tested.

5.7 CALIBRATION STANDARDS

The FID was calibrated for mid-range part-per-million-by-volume (ppmv) level analysis using gas proportions similar to the following:

- 1) 100 ppmv EtO, balance nitrogen
- 2) 50 ppmv EtO, balance nitrogen (audit gas)
- 3) 10 ppmv EtO, balance nitrogen
- 4) 1 ppmv EtO, balance nitrogen

The PID was calibrated for low-range ppmv level analysis using gas proportions similar to the following:

- 1) 100 ppmv EtO, balance nitrogen
- 2) 50 ppmv EtO, balance nitrogen (audit gas)
- 3) 10 ppmv EtO, balance nitrogen
- 4) 1 ppmv EtO, balance nitrogen

Each of these calibration standards was in a separate, certified manufacturer's cylinder. Copies of the calibration gas laboratory certificates are attached as Appendix E.

5.8 SAMPLING DURATION

Sampling was performed during the entire backvent duration of one of the eight sterilizers, and during three one hour time intervals of the aeration process.

Backvent testing was performed with freshly sterilized product in the sterilization chamber, upon initial opening of the backvent valve at the conclusion of the sterilizer vacuum vent phase. All aeration testing was performed with freshly sterilized product in the aeration rooms.

5.9 CONTROL-EFFICIENCY/MASS-EMISSIONS CALCULATIONS

Mass emissions of EtO during the backvent and aeration phases were calculated using the following equation:

$$\text{MassRate} = (\text{VolFlow})(\text{MolWt})(\text{ppmv EtO}/10^6)/(\text{MolVol})$$

Where:

MassRate = EtO mass flow rate, pounds per minute

VolFlow = Corrected volumetric flow rate, standard cubic feet per minute at 68 degrees F

MolWt = 44.05 pounds EtO per pound mole

ppmv EtO = EtO concentration, parts per million by volume

10^6 = Conversion factor, ppmv per "cubic foot per cubic foot"

MolVol = 385.32 cubic feet per pound mole at one atmosphere and 68 degrees F

Mass-mass control efficiency of EtO was calculated for the backvent/aeration. Results of the control-efficiency testing are presented in Section 8.0 and Tables 1 and 2.

5.11 LEAK TESTING

Testing for EtO leaks was conducted by CARB Method 21 in accordance with SCAQMD Rule 1405. Testing was conducted during the exposure and chamber evacuation phases of the sterilization and exhaust cycles of the sterilizer. These conditions represent maximum sterilant gas mass flow through the system.

EtO leak testing was performed using a Bacharach EO Leakator, Part Number 19-7057, Gas Leak Detector, equipped with a metal-oxide semi-conductor sensor, an audible signal, and a visual display. The lower detection limit of the instrument is less than the leak definition specified for EtO in SCAQMD Rule 1405. This leak definition is 10 ppm EtO for sterilant gas composed of 100 percent EtO.

EtO concentration was measured one centimeter from the surface of all accessible components of the sterilizer and emission-control device that are potential sources of EtO leakage. Each component found to be leaking was identified and tagged. The date and the results of the EtO measurement for each leaking component were entered on that component's tag. The leak test data is summarized in Section 8.0 and in Table 3.

6.0 TEST SCENARIO

The emission-control device was tested under conditions of the maximum EtO mass flow to the emission-control device under normal operating conditions. The maximum EtO mass flow to the emission-control device was achieved by testing the sterilizer through its entire backvent phase and through three one-hour intervals of the 24-hour/day aeration process, with freshly sterilized product in aeration.

7.0 QA/QC

7.1 FIELD TESTING QUALITY ASSURANCE

At the beginning of the test, the sampling system was leak checked at a vacuum of 15 inches of mercury. The sampling system was considered leak free when the flow indicated by the rotameters fell to zero.

At the beginning of the test, a system blank was analyzed to ensure that the sampling system was free of EtO. Ambient air was introduced at the end of the heated sampling line and drawn through the sampling system line to the GC for analysis. The resulting chromatogram also provided a background level for non-EtO components (i.e. ambient air, carbon dioxide, water vapor) which are present in the source gas stream due to the ambient dilution air which is drawn into the emission-control device, and due to the destruction of EtO by the emission-control device which produces carbon dioxide and water vapor. This chromatogram, designated AMB, is included with the calibration data in Appendix A.

7.2 CALIBRATION PROCEDURES

The GC system was calibrated at the beginning and conclusion of each day's testing. Using the Peaksimple II analytical software, a point-to-point calibration curve was constructed for each detector. A gas cylinder of similar composition as the calibration gases, but certified by a separate supplier, was used to verify calibration gas composition and GC performance.

All calibration gases and support gases used were of the highest purity and quality available. A copy of the laboratory certification for each calibration gas is attached as Appendix E.

8.0 TEST RESULTS

The Donaldson EtO Abator demonstrated an EtO control efficiency of 99.964 percent for the control of backvent emissions, and 99.964 percent for the control of aeration emissions. SCAQMD Rule 1405 specifies that EtO emission-control devices, at gas sterilization facilities with EtO usage in the range of Sterigenics, Inc., must have an EtO control efficiency of 99.0 percent or more during the aeration and backvent phases. The emission-control device met this requirement.

The entire gas sterilization and emission control system was also found to be leak free.

The test results are summarized in Table 1, 2 and 3. Chromatograms and chromatographic supporting data are attached as Appendices A through C. Copies of field data and calculation worksheets are attached as Appendix D.

TABLES

TABLE 1
ETHYLENE OXIDE CONTROL EFFICIENCY - BACKVENT
OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE
OPERATED BY STERIGENICS, INC.
IN ONTARIO, CALIFORNIA
ON OCTOBER 13, 2015

<u>CYCLE</u> <u>PHASE</u>	<u>INJECTION</u> <u>TIME</u>	<u>INLET ETO</u> <u>CONC. (PPM)(1)</u>	<u>OUTLET ETO</u> <u>CONC. (PPM)(2)</u>	<u>ETO CONTROL</u> <u>EFFICIENCY</u>
Backvent(3)	1502	19.6	0.01	99.9490
Backvent	1503	20.9	0.01	99.9522
Backvent	1505	23.7	0.01	99.9578
Backvent	1506	23.4	0.01	99.9573
Backvent	1507	29.1	0.01	99.9656
Backvent	1508	36.2	0.01	99.9724
Backvent	1509	34.0	0.01	99.9706
Backvent	1511	33.3	0.01	99.9700
Backvent	1512	32.2	0.01	99.9689
Backvent	1513	31.4	0.01	99.9682
Backvent	1514	32.2	0.01	99.9689
Backvent	1515	31.3	0.01	99.9681
Backvent	1516	<u>30.9</u>	<u>0.01</u>	<u>99.9676</u>
TIME-WEIGHTED AVERAGE:		29.09	0.0100	99.9643
SCAQMD REQUIRED CONTROL EFFICIENCY:				99.0

Notes:

(1) - PPM = parts per million by volume

(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.

(3) - The backvent phase test run started at 15:01, ended at 15:16.

(4) - The average catalyst bed temperature recorded during the test run was 311.2 degrees F.

TABLE 2
ETHYLENE OXIDE CONTROL EFFICIENCY - AERATION
OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE
OPERATED BY STERIGENICS, INC.
IN ONTARIO, CALIFORNIA
ON OCTOBER 13, 2015

<u>RUN NUMBER</u>	<u>INJECTION TIME</u>	<u>INLET ETO CONC. (PPM)(1)</u>	<u>OUTLET ETO CONC. (PPM)(2)</u>	<u>ETO CONTROL EFFICIENCY</u>
1(3)	1520	29.5	0.01	99.9661
1	1525	28.8	0.01	99.9653
1	1530	28.2	0.01	99.9645
1	1535	27.2	0.01	99.9632
1	1540	26.6	0.01	99.9624
1	1545	25.9	0.01	99.9614
1	1550	24.9	0.01	99.9598
1	1555	25.0	0.01	99.9600
1	1600	25.3	0.01	99.9605
1	1605	25.1	0.01	99.9602
1	1610	24.3	0.01	99.9588
1	1615	24.4	0.01	99.9590
2(4)	1620	24.3	0.01	99.9588
2	1625	23.9	0.01	99.9582
2	1630	24.4	0.01	99.9590
2	1635	24.2	0.01	99.9587
2	1640	23.7	0.01	99.9578
2	1645	24.0	0.01	99.9583
2	1650	23.6	0.01	99.9576
2	1655	23.1	0.01	99.9567
2	1700	23.1	0.01	99.9567
2	1705	25.2	0.01	99.9603
2	1710	26.5	0.01	99.9623
2	1715	24.5	0.01	99.9592
3(5)	1720	24.2	0.01	99.9587
3	1725	23.5	0.01	99.9574
3	1730	23.9	0.01	99.9582
3	1735	23.8	0.01	99.9580
3	1740	23.9	0.01	99.9582
3	1745	56.2	0.01	99.9822
3	1750	52.8	0.01	99.9811
3	1755	49.5	0.01	99.9798
3	1800	48.5	0.01	99.9794
3	1805	49.2	0.01	99.9797
3	1810	48.0	0.01	99.9792
3	1815	<u>47.4</u>	<u>0.01</u>	<u>99.9789</u>
TIME-WEIGHTED AVERAGE:		29.91	0.0100	99.9638
SCAQMD REQUIRED CONTROL EFFICIENCY:				99.0%

Notes:

- (1) - PPM = parts per million by volume
- (2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
- (3) - Aeration Phase Test Run #1 started at 15:17, ended at 16:17.
- (4) - Aeration Phase Test Run #2 started at 16:17, ended at 17:17.
- (5) - Aeration Phase Test Run #3 started at 17:17, ended at 18:17.
- (4) - The average catalyst bed temperature recorded during the test was 311.1 degrees F.

TABLE 3
ETHYLENE OXIDE LEAK TESTING
OF A GAS STERILIZATION SYSTEM (8 STERILIZERS)
OPERATED BY STERIGENICS, INC.
IN ONTARIO, CALIFORNIA
ON OCTOBER 13, 2015

<u>COMPONENT GROUP TESTED</u>	<u>LEAKING COMPONENTS FOUND</u>	<u>CONCENTRATION</u>
Supply Tanks / Load Stations	None	<1.0 ppm (1)
Sterilizer Inlets / Inbleed Valves	None	<1.0 ppm
Door Seals	None	<1.0 ppm
Sterilizer Outlets / Chamber Drains	None	<1.0 ppm
Vacuum Pumps	None	<1.0 ppm
Emission Control Device Inlet	None	<1.0 ppm

Notes:

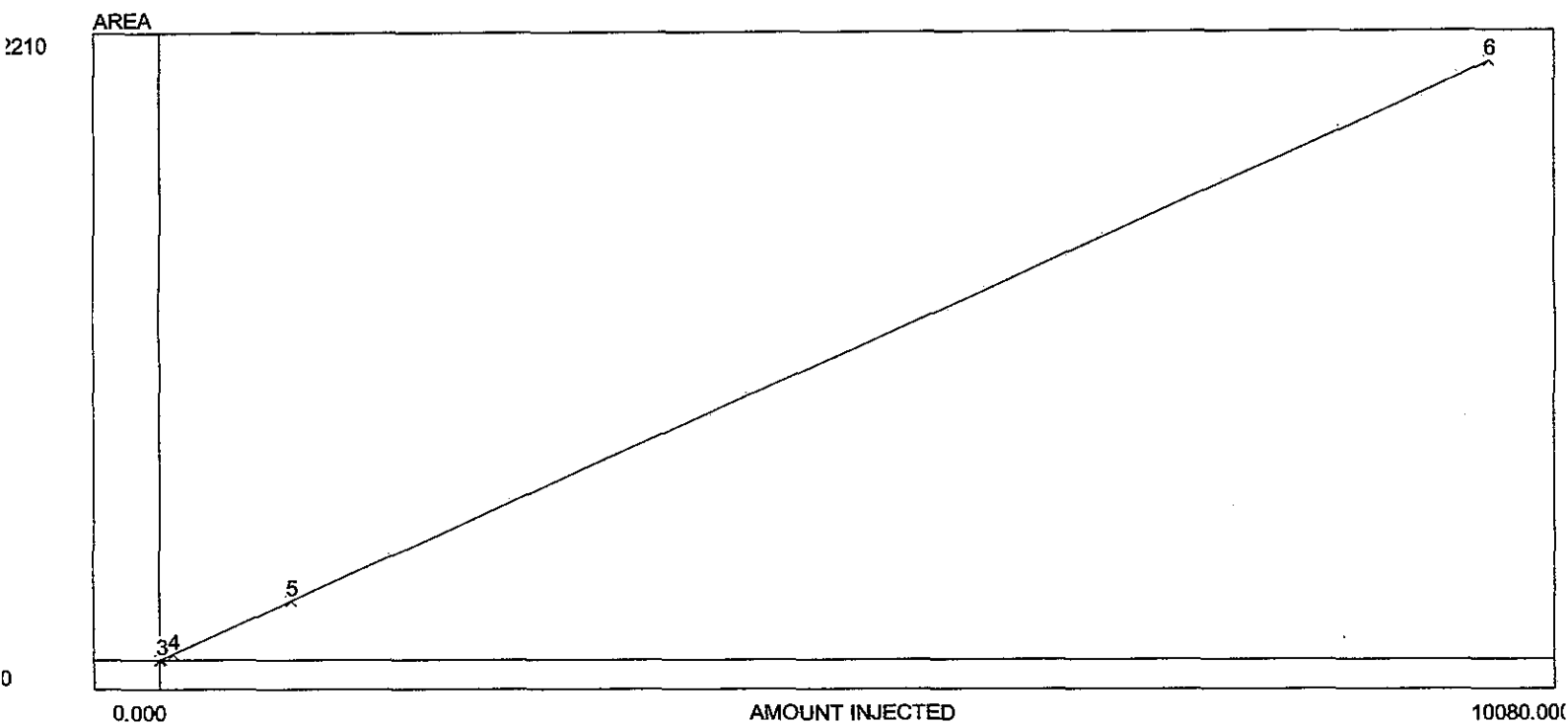
(1) - PPM = parts per million by volume

APPENDICES

APPENDIX A
Calibration Data

Component list: 12/1/12 12:00:00

Peak	Name	Start	End	Calibration	Int.Std	Units
1	Dead Vol / Air	0.000	0.350		0.000	
2	Ambient H2O	0.350	0.500		0.000	
3	Ethylene Oxide	0.500	0.600	C:\peak359\1Ster	0.000	15.ppm
4	Acetaldehyde	0.600	0.800		0.000	
5	CO2	0.800	1.000		0.000	



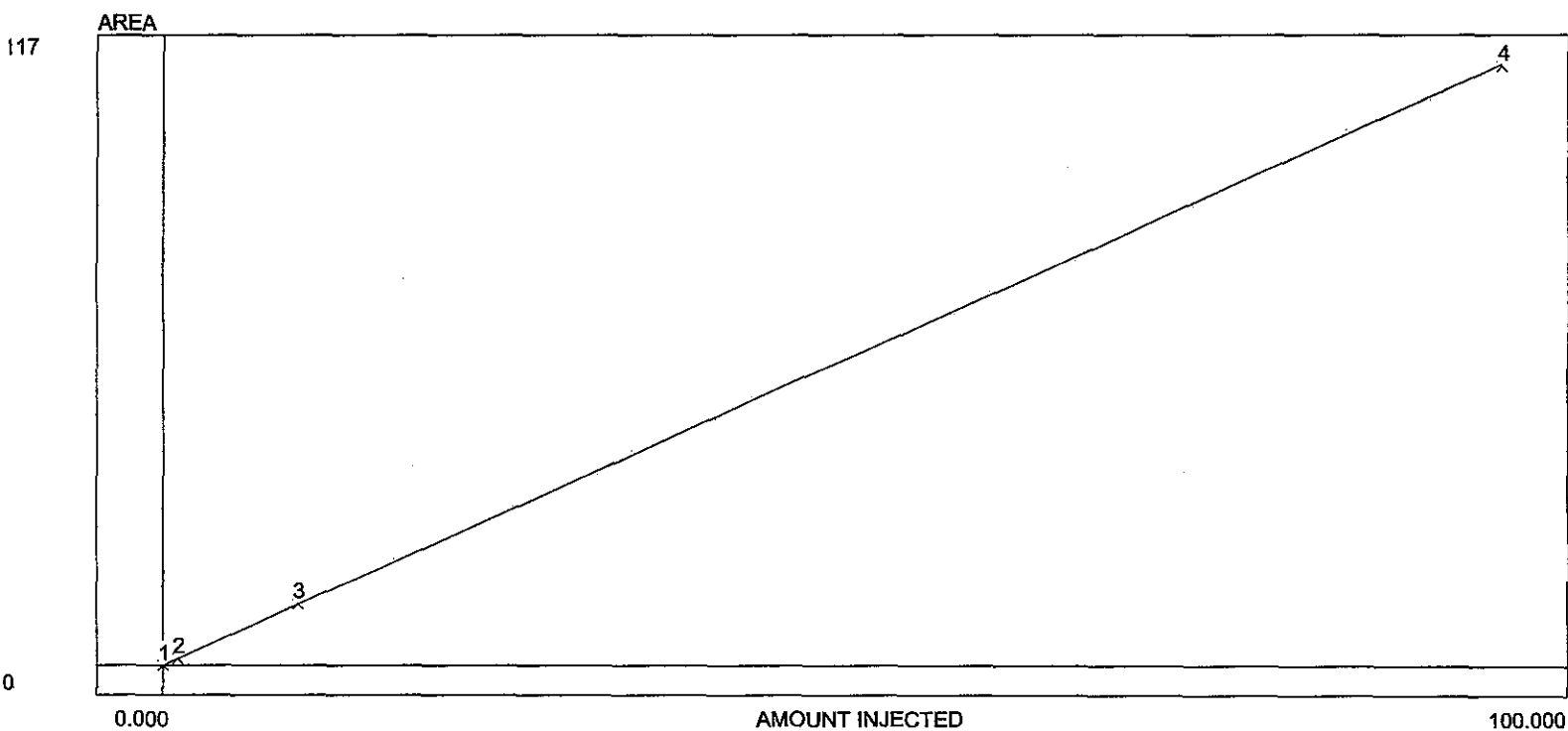
Avg slope of curve: 0.22
Y-axis intercept: 0.00
Linearity: 1.00
Number of levels: 6
SD/rel SD of CF's: 0.1/49.0
Y=0.2190X
r2: 1.0000

Last calibrated: Tue Oct 13 18:40:30 2015

Lvl.	Area/ht.	Amount	CF	Current	Previous #1	Previous #2
1	0.000	0.000	0.000	0.000	N/A	N/A
2	0.241	1.100	0.219	0.241	N/A	N/A
3	2.210	10.100	0.219	2.210	N/A	N/A
4	21.900	100.000	0.219	21.900	N/A	N/A
5	219.000	1000.000	0.219	219.000	N/A	N/A
6	2210.000	10080.000	0.219	2210.000	N/A	N/A

Component file: STD - Test1

Peak	Name	Start	End	Calibration	Int.Std	Units
1	Dead Vol / Air	0.000	0.350		0.000	
2	Ambient H2O	0.350	0.500		0.000	
3	Ethylene Oxide	0.500	0.600	C:\peak359\2Ster	0.00015	ppm
4	Acetaldehyde	0.600	0.800		0.000	
5	CO2	0.800	1.000		0.000	



Avg slope of curve: 1.17

Y-axis intercept: -0.00

Linearity: 1.00

Number of levels: 4

SD/rel SD of CF's: 0.6/66.7

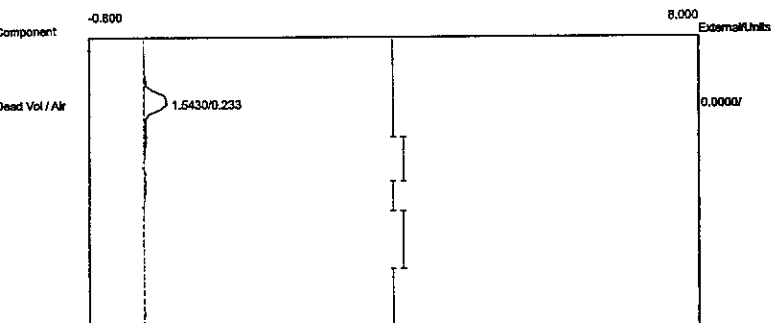
Y=1.1736X

r2: 1.0000

Last calibrated: Tue Oct 13 18:39:40 2015

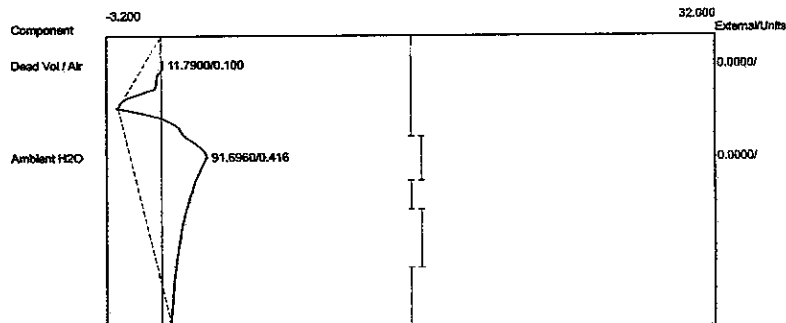
Lvl.	Area/ht.	Amount	CF	Current	Previous #1	Previous #2
1	0.000	0.000	0.000	0.000	N/A	N/A
2	1.290	1.100	1.173	1.290	N/A	N/A
3	11.900	10.100	1.178	11.900	N/A	N/A
4	117.000	100.000	1.170	117.000	N/A	N/A

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: PreCal
 Analysis date: 10/13/2015 13:26:28
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-Amb.CHR (c:\peak359)
 Sample: Ambient Background
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.5430	0.0000	
		1.5430	0.0000	

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: PreCal
 Analysis date: 10/13/2015 13:26:28
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-Amb.CHR (c:\peak359)
 Sample: Ambient Background
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	11.7900	0.0000	
Ambient H2O	0.416	91.6960	0.0000	
		103.4860	0.0000	

Client: Sterigenics Ontario

Client ID: PreCal

Analysis date: 10/13/2015 13:34:49

Method: Direct Injection

Description: CHANNEL 1 - FID

Column: 1% SP-1000, Carboxpack B

Carrier: HELIUM

Temp. prog: eto-100.tem

Components: eto1-100.cpt

Data file: 1SterOnt2015-Audit.CHR (c:\peak359)

Sample: 48.8 ppm EtO std

Operator: D. Kremer

Client: Sterigenics Ontario

Client ID: PreCal

Analysis date: 10/13/2015 13:34:49

Method: Direct Injection

Description: CHANNEL 2 - PID

Column: 1% SP-1000, Carboxpack B

Carrier: HELIUM

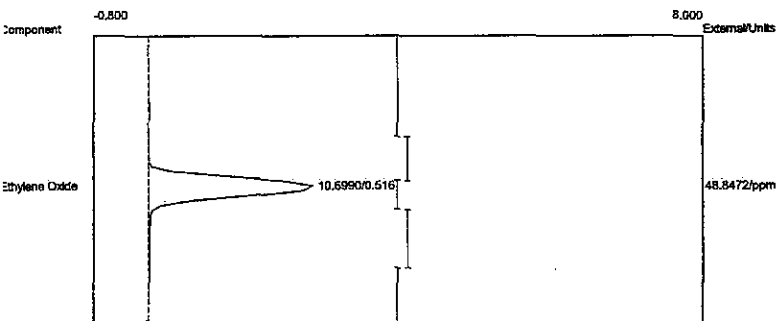
Temp. prog: eto-100.tem

Components: eto2-100.cpt

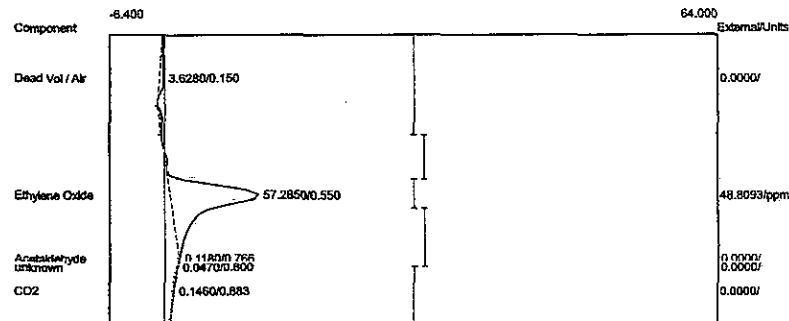
Data file: 2SterOnt2015-Audit.CHR (c:\peak359)

Sample: 48.8 ppm EtO std

Operator: D. Kremer

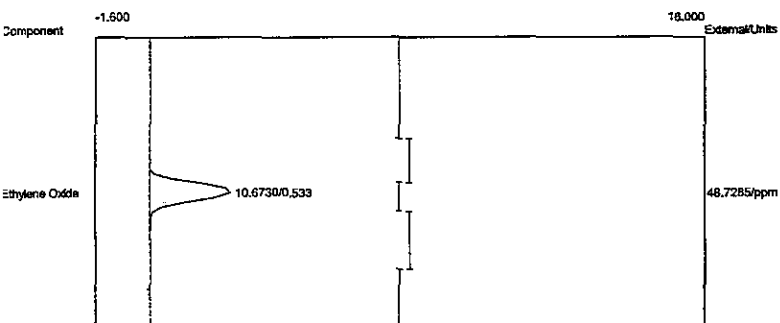


Component	Retention	Area	External Units
Ethylene Oxide	0.516	10.6990	48.8472 ppm
		10.6990	48.8472



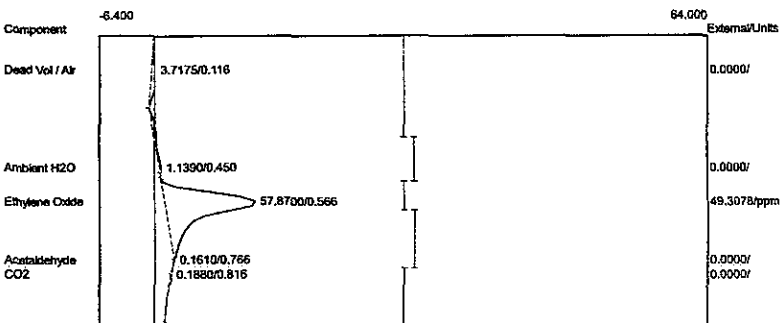
Component	Retention	Area	External Units
Dead Vol / Air	0.150	3.6280	0.0000
Ethylene Oxide	0.550	57.2850	48.8093 ppm
Acetaldehyde	0.766	0.1180	0.0000
CO2	0.883	0.1460	0.0000
		61.1770	48.8093

Client: Sterigenics Ontario
 Client ID: PostCal
 Analysis date: 10/13/2015 18:42:24
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-PAudit.CHR (c:\peak359)
 Sample: 48.8 ppm EtO std
 Operator: D. Kremer



Component	Retention	Area	External Units
Ethylene Oxide	0.533	10.6730	48.7285 ppm
		10.6730	48.7285

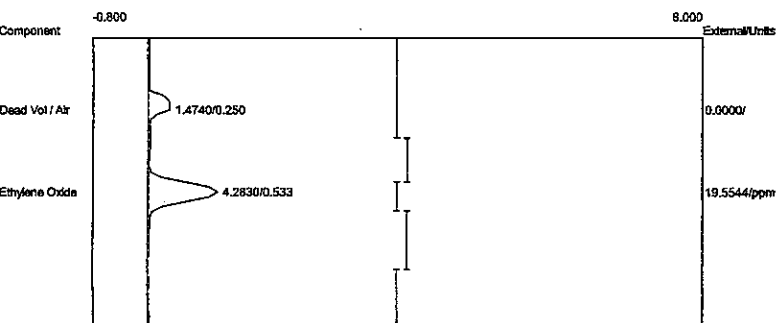
Client: Sterigenics Ontario
 Client ID: PostCal
 Analysis date: 10/13/2015 18:42:24
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-PAudit.CHR (c:\peak359)
 Sample: 48.8 ppm EtO std
 Operator: D. Kremer



Component	Retention	Area	External Units
Dead Vol / Air	0.116	3.7175	0.0000
Ambient H2O	0.450	1.1390	0.0000
Ethylene Oxide	0.566	57.8700	49.3078 ppm
Acetaldehyde	0.766	0.1610	0.0000
CO2	0.816	0.1880	0.0000
		63.0755	49.3078

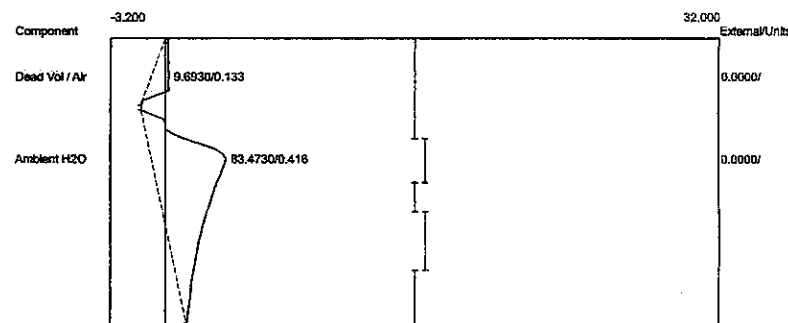
APPENDIX B
Backvent Chromatograms

Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:02:37
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-B01.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



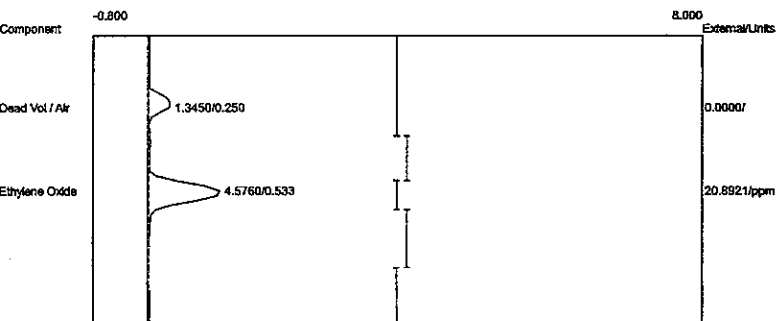
Component	Retention	Area	External Units
Dead Vol / Air	0.250	1.4740	0.0000
Ethylene Oxide	0.533	4.2830	19.5544 ppm
		5.7570	19.5544

Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:02:37
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-B01.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



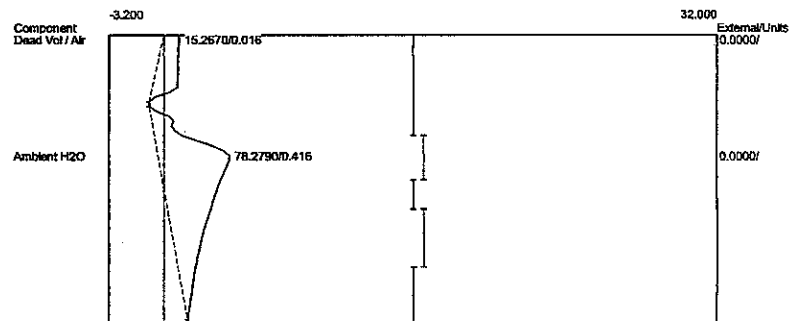
Component	Retention	Area	External Units
Dead Vol / Air	0.133	9.6930	0.0000
Ambient H2O	0.416	83.4730	0.0000
		93.1660	0.0000

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:03:53
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-B02.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



Component	Retention	Area	External Units
Dead Vol / Air	0.250	1.3450	0.0000
Ethylene Oxide	0.533	4.5760	20.8921 ppm
		5.9210	20.8921

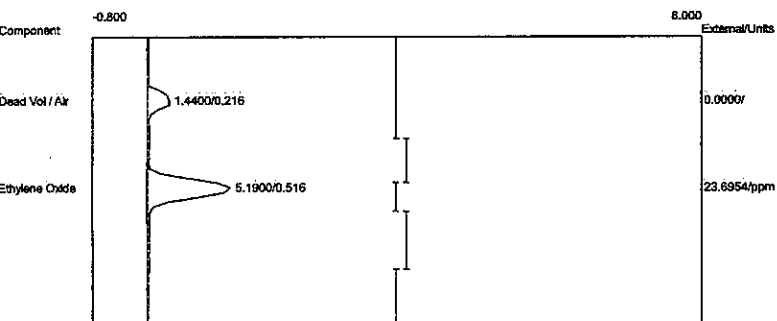
Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:03:53
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-B02.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



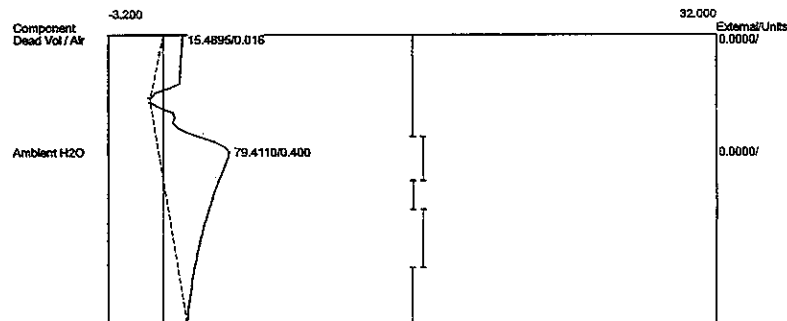
Component	Retention	Area	External Units
Dead Vol / Air	0.016	15.2670	0.0000
Ambient H2O	0.416	78.2790	0.0000
		93.5460	0.0000

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:05:02
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-B03.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:05:02
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-B03.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer

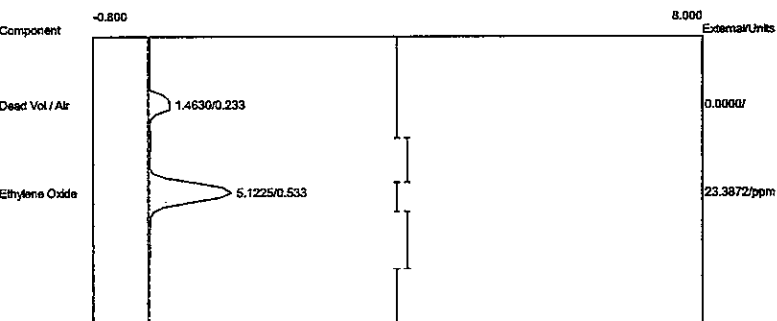


Component	Retention	Area	External Units
Dead Vol / Air	0.216	1.4400	0.0000
Ethylene Oxide	0.516	5.1900	23.6954 ppm
		6.6300	23.6954



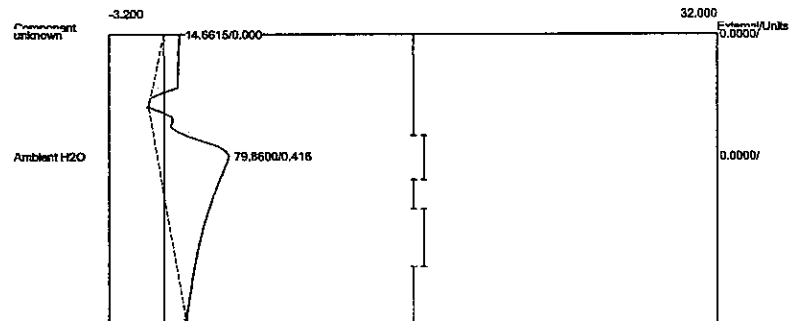
Component	Retention	Area	External Units
Dead Vol / Air	0.016	15.4895	0.0000
Ambient H2O	0.400	79.4110	0.0000
		94.9005	0.0000

Lab name: ECSI
 Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:06:19
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-B04.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



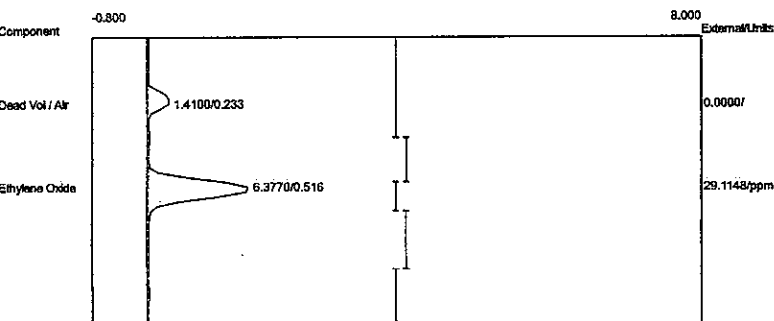
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.4630	0.0000
Ethylene Oxide	0.533	5.1225	23.3872 ppm
		6.5855	23.3872

Lab name: ECSI
 Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:06:19
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-B04.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



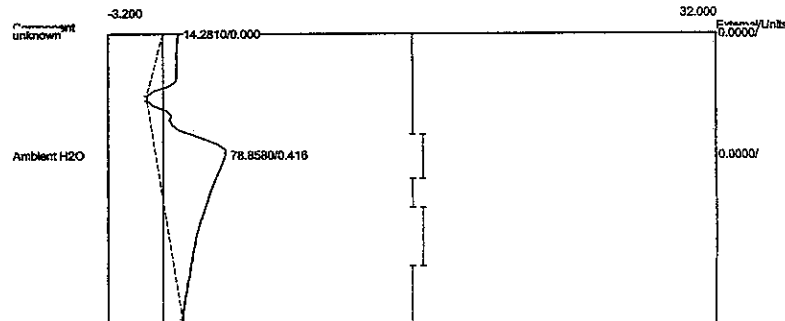
Component	Retention	Area	External Units
Ambient H2O	0.416	79.8600	0.0000
		79.8600	0.0000

Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:07:36
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-B05.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



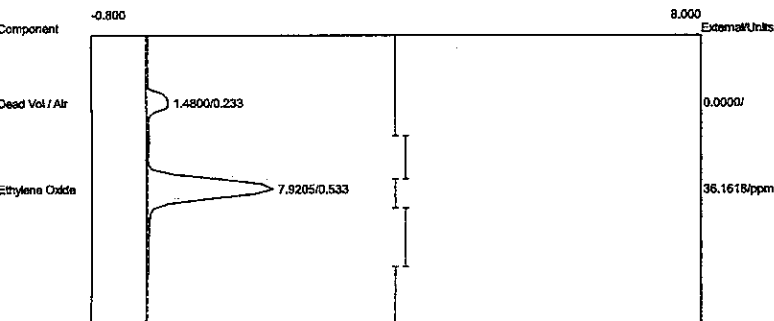
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.4100	0.0000
Ethylene Oxide	0.516	6.3770	29.1148 ppm
		7.7870	29.1148

Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:07:36
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-B05.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



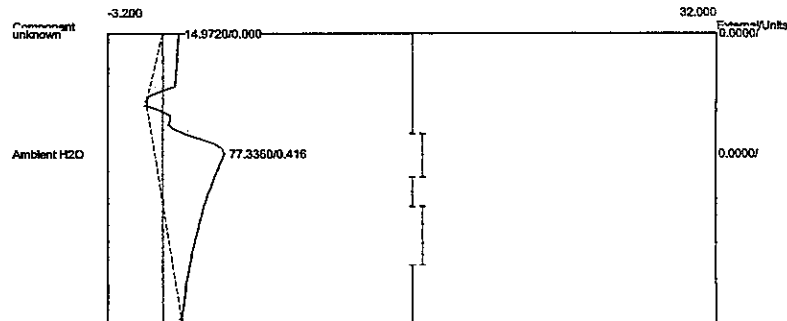
Component	Retention	Area	External Units
Ambient H2O	0.416	78.8580	0.0000
		78.8580	0.0000

Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:08:44
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-B06.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



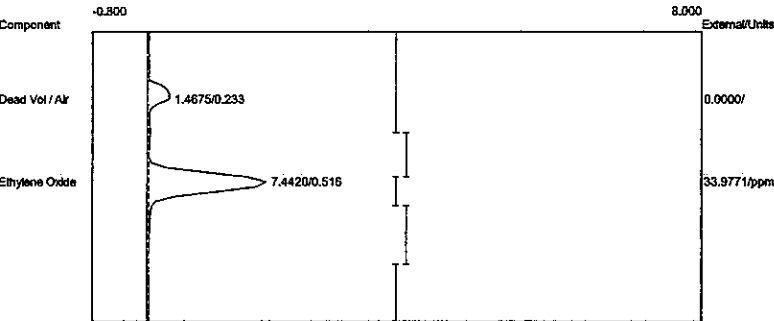
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.4800	0.0000	
Ethylene Oxide	0.533	7.9205	36.1618	ppm
		9.4005	36.1618	

Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:08:44
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-B06.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



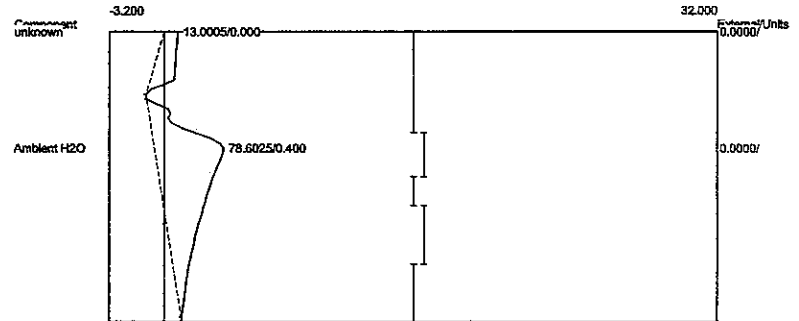
Component	Retention	Area	External	Units
Ambient H2O	0.416	77.3360	0.0000	
		77.3360	0.0000	

Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:09:56
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-B07.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



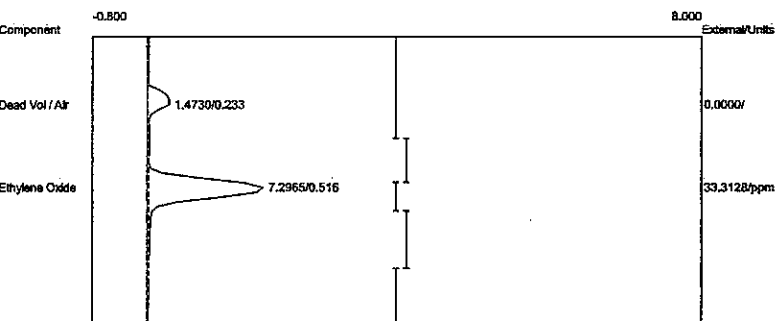
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.4675	0.0000	
Ethylene Oxide	0.516	7.4420	33.9771	ppm
		8.9095	33.9771	

Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:09:56
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-B07.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



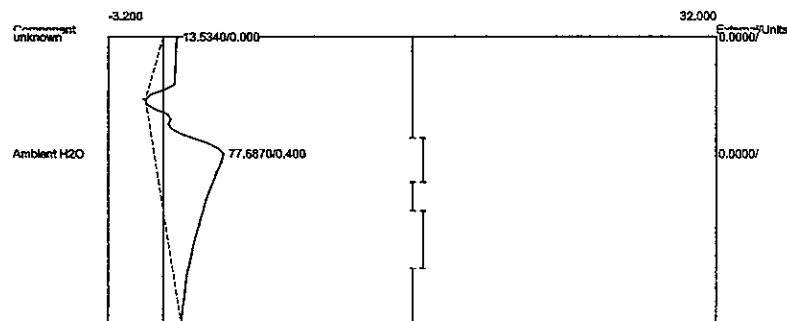
Component	Retention	Area	External	Units
Ambient H2O	0.400	78.6025	0.0000	
		78.6025	0.0000	

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:11:04
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-B08.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



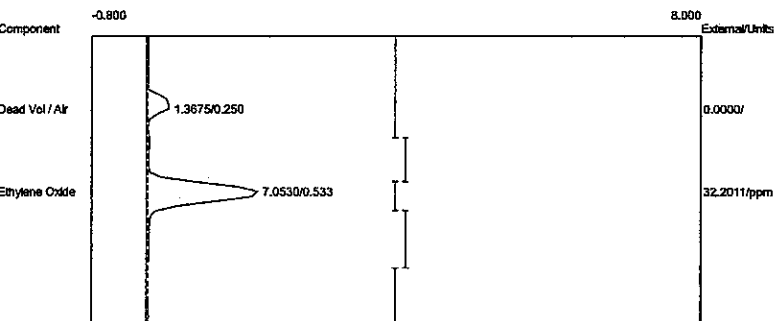
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.4730	0.0000
Ethylene Oxide	0.516	7.2965	33.3128 ppm
		8.7695	33.3128

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:11:04
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-B08.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



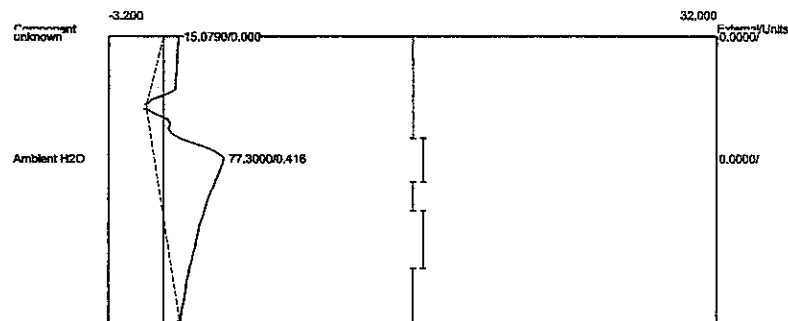
Component	Retention	Area	External Units
Ambient H2O	0.400	77.6870	0.0000
		77.6870	0.0000

Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:12:10
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-B09.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



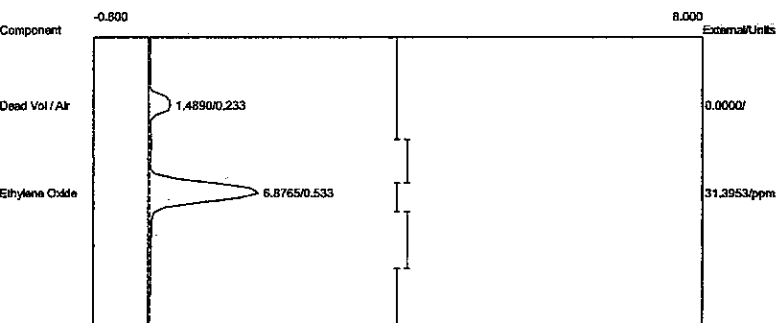
Component	Retention	Area	External Units
Dead Vol / Air	0.250	1.3675	0.0000
Ethylene Oxide	0.533	7.0530	32.2011 ppm
		8.4205	32.2011

Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:12:10
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-B09.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



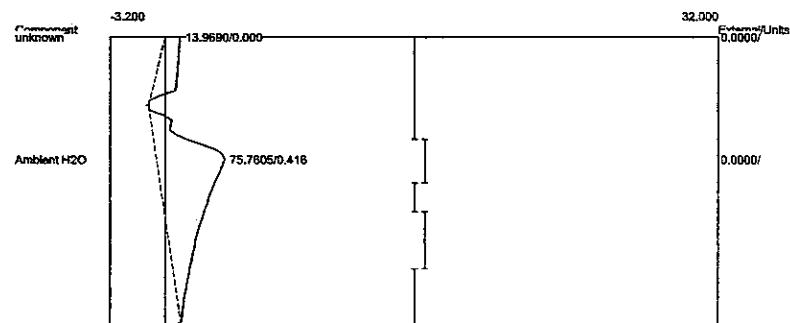
Component	Retention	Area	External Units
Ambient H2O	0.416	77.3000	0.0000
		77.3000	0.0000

Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:13:14
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-B10.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



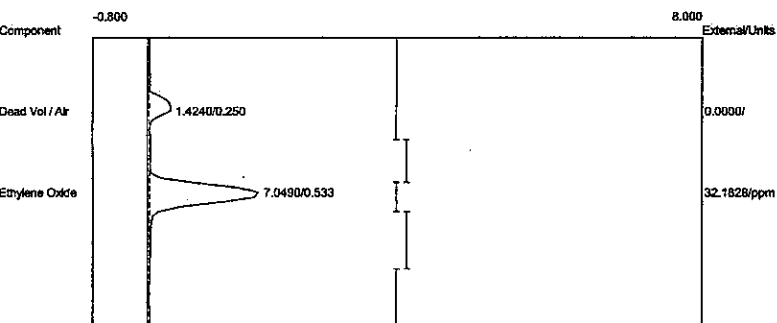
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.4890	0.0000
Ethylene Oxide	0.533	6.8765	31.3953 ppm
		8.3655	31.3953

Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:13:14
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-B10.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



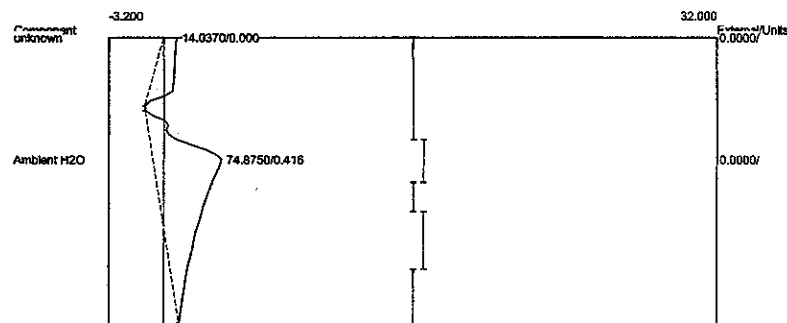
Component	Retention	Area	External Units
Ambient H2O	0.416	75.7605	0.0000
		75.7605	0.0000

Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:14:20
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-B11.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



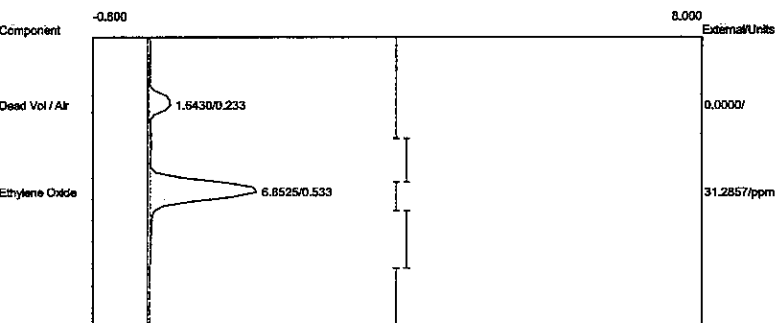
Component	Retention	Area	External Units
Dead Vol / Air	0.250	1.4240	0.0000
Ethylene Oxide	0.533	7.0490	32.1828 ppm
		8.4730	32.1828

Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:14:20
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-B11.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



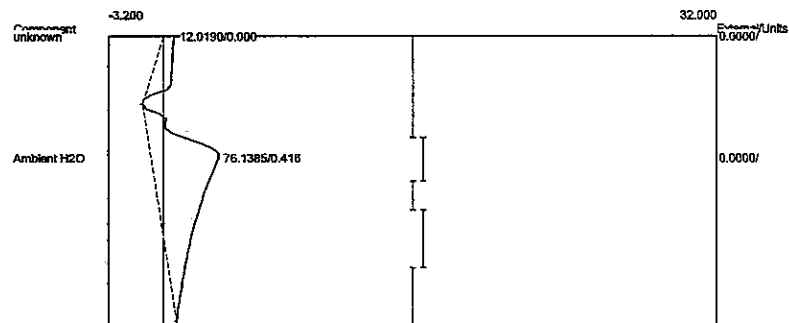
Component	Retention	Area	External Units
Ambient H2O	0.416	74.8750	0.0000
		74.8750	0.0000

Lab Name: EOS
 Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:15:29
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-B12.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



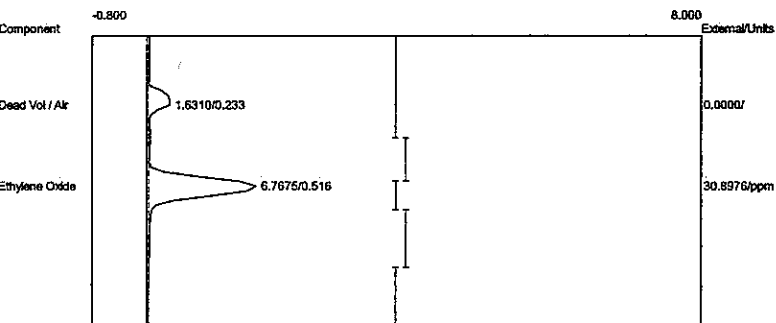
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.6430	0.0000
Ethylene Oxide	0.533	6.8525	31.2857 ppm
		8.4955	31.2857

Lab Name: EOS
 Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:15:29
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-B12.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



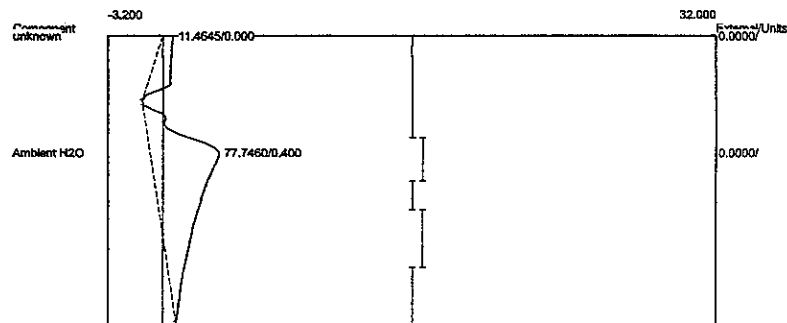
Component	Retention	Area	External Units
Ambient H2O	0.416	76.1385	0.0000
		76.1385	0.0000

Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:16:35
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-B13.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.6310	0.0000
Ethylene Oxide	0.516	6.7675	30.8976 ppm
		8.3985	30.8976

Client: Sterigenics Ontario
 Client ID: Backvent
 Analysis date: 10/13/2015 15:16:35
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-B13.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer

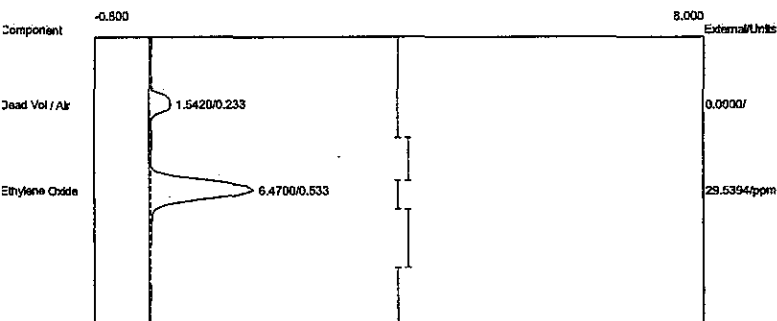


Component	Retention	Area	External Units
Ambient H2O	0.400	77.7460	0.0000
		77.7460	0.0000

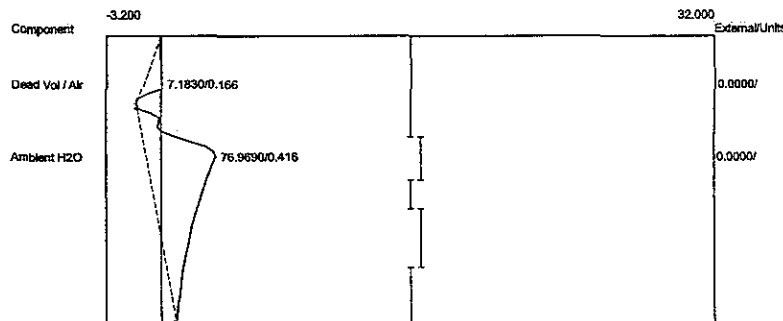
APPENDIX C
Aeration Chromatograms

Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 15:20:25
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-1A01.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer

Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 15:20:25
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-1A01.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer

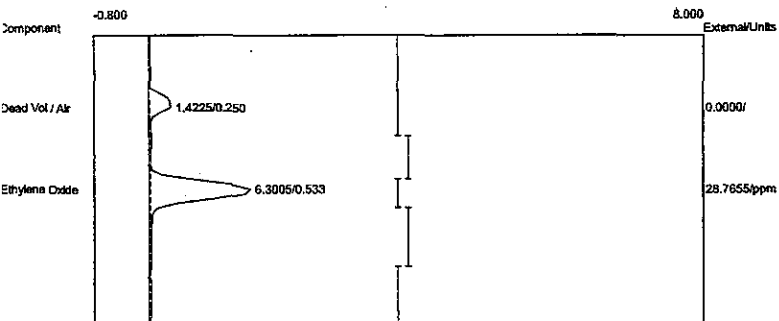


Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.5420	0.0000
Ethylene Oxide	0.533	6.4700	29.5394 ppm
		8.0120	29.5394



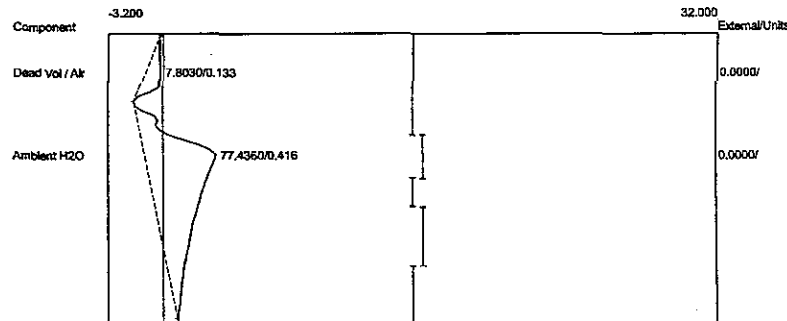
Component	Retention	Area	External Units
Dead Vol / Air	0.166	7.1830	0.0000
Ambient H2O	0.416	76.9690	0.0000
		84.1520	0.0000

Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 15:25:33
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-1A02.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



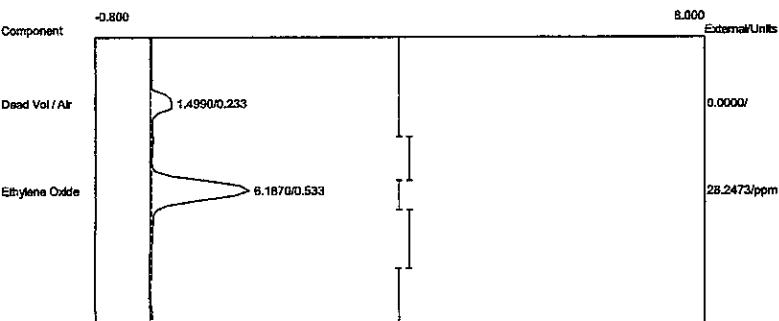
Component	Retention	Area	External Units
Dead Vol / Air	0.250	1.4225	0.0000
Ethylene Oxide	0.533	6.3005	28.7655 ppm
	7.7230		28.7655

Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 15:25:33
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-1A02.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



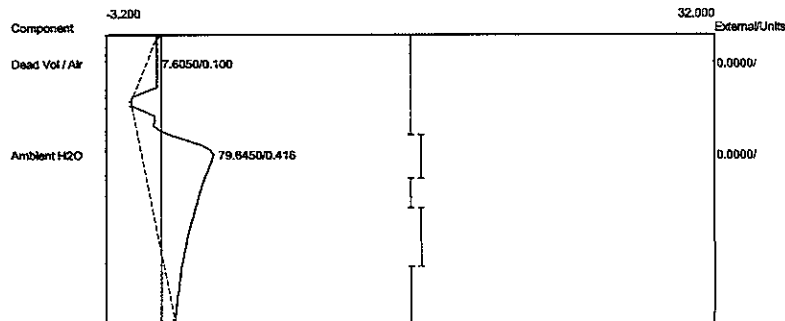
Component	Retention	Area	External Units
Dead Vol / Air	0.133	7.8030	0.0000
Ambient H2O	0.416	77.4360	0.0000
		85.2390	0.0000

Lab Name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 15:30:14
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-1A03.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



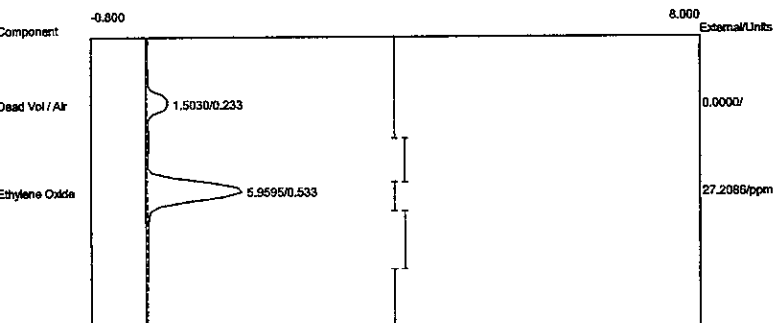
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.4990	0.0000
Ethylene Oxide	0.533	6.1870	28.2473 ppm
		7.6860	28.2473

Lab Name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 15:30:14
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-1A03.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



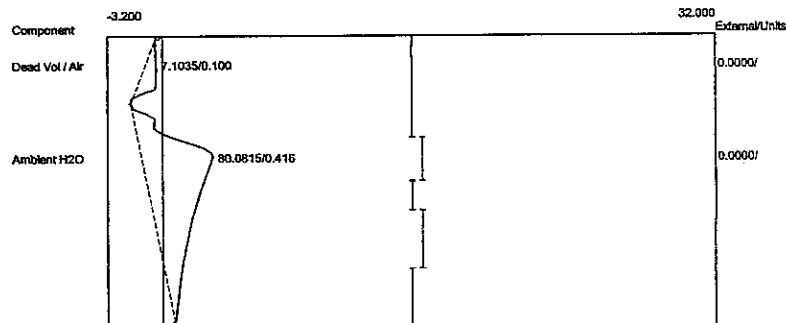
Component	Retention	Area	External Units
Dead Vol / Air	0.100	7.6050	0.0000
Ambient H2O	0.416	79.6450	0.0000
		87.2500	0.0000

Lab Name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 15:35:19
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-1A04.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



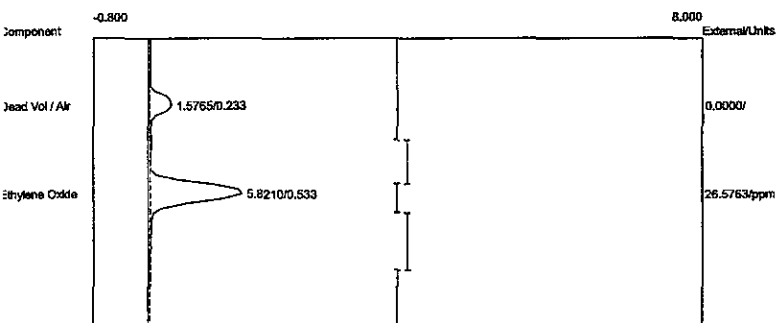
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.5030	0.0000
Ethylene Oxide	0.533	5.9595	27.2086 ppm
		7.4625	27.2086

Lab Name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 15:35:19
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-1A04.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



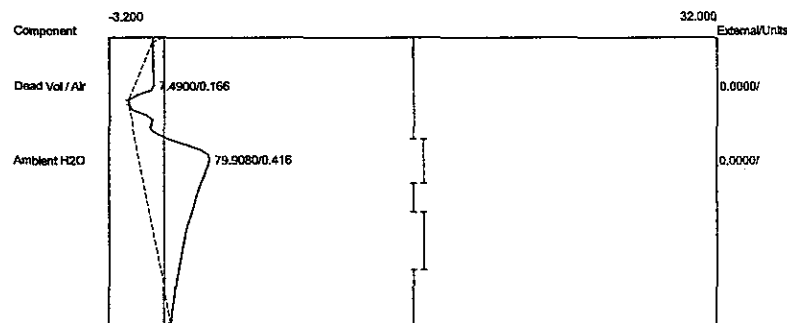
Component	Retention	Area	External Units
Dead Vol / Air	0.100	7.1035	0.0000
Ambient H2O	0.416	80.0815	0.0000
		87.1850	0.0000

Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 15:41:01
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-1A05.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



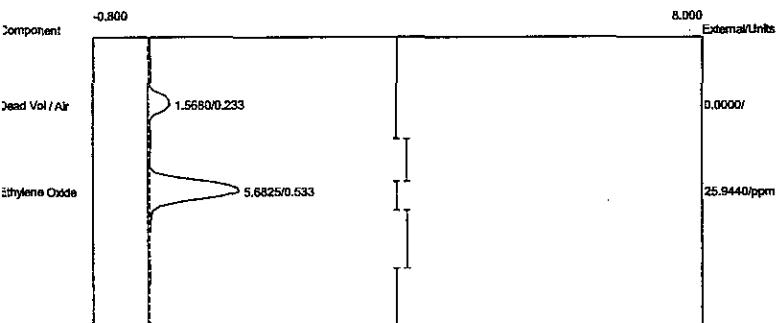
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.5765	0.0000
Ethylene Oxide	0.533	5.8210	26.5763 ppm
		7.3975	26.5763

Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 15:41:01
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-1A05.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



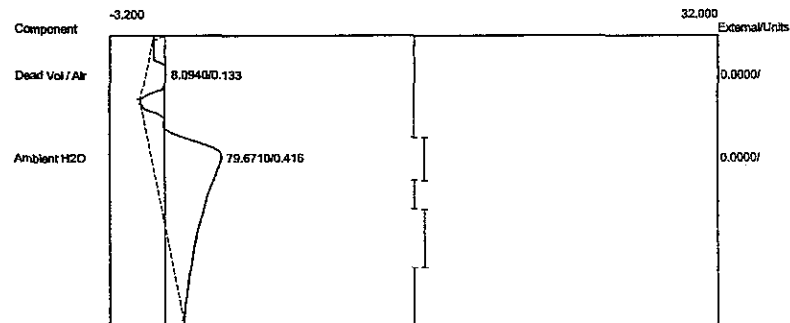
Component	Retention	Area	External Units
Dead Vol / Air	0.166	7.4900	0.0000
Ambient H2O	0.416	79.9080	0.0000
		87.3980	0.0000

Lab name: EOS
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 15:45:05
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-1A06.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



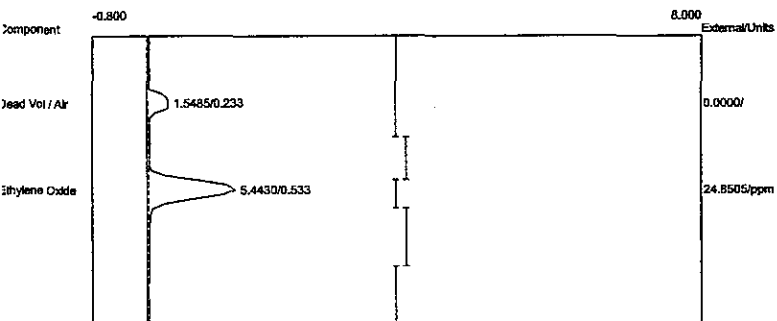
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.5680	0.0000
Ethylene Oxide	0.533	5.6825	25.9440 ppm
		7.2505	25.9440

Lab name: EOS
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 15:45:05
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-1A06.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



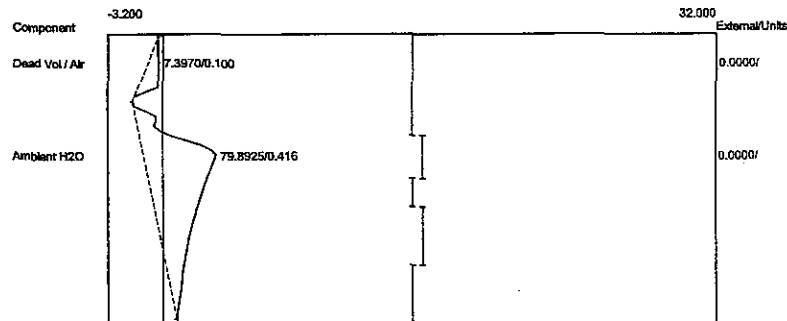
Component	Retention	Area	External Units
Dead Vol / Air	0.133	8.0940	0.0000
Ambient H2O	0.416	79.6710	0.0000
		87.7650	0.0000

Lab Name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 15:50:25
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-1A07.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



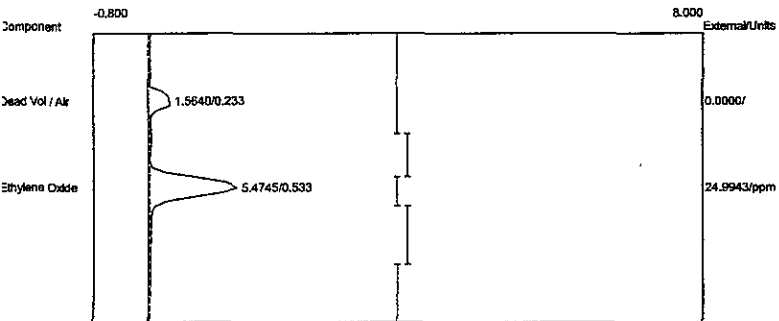
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.5485	0.0000
Ethylene Oxide	0.533	5.4430	24.8505 ppm
		6.9915	24.8505

Lab Name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 15:50:25
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-1A07.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



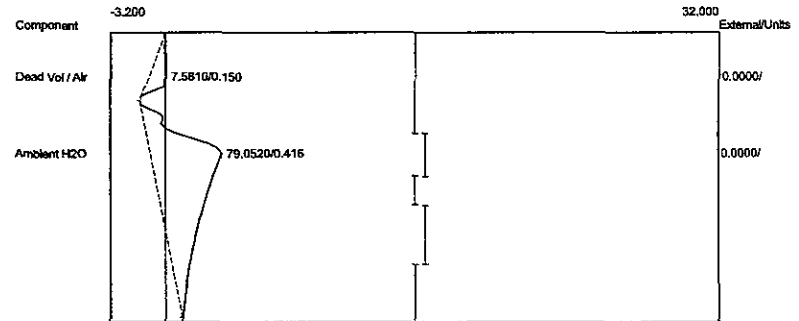
Component	Retention	Area	External Units
Dead Vol / Air	0.100	7.3970	0.0000
Ambient H2O	0.416	79.8925	0.0000
		87.2895	0.0000

Lab Name: EOS
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 15:55:09
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-1A08.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



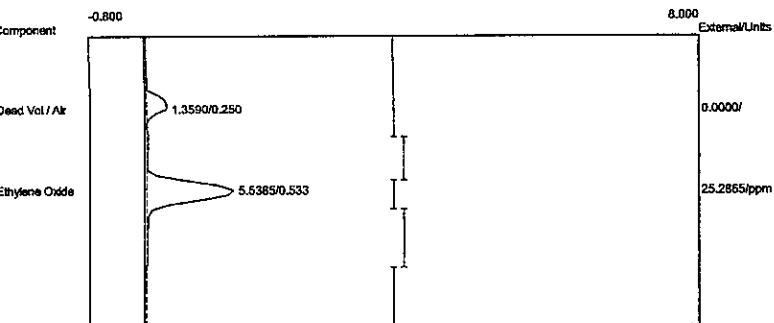
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.5640	0.0000
Ethylene Oxide	0.533	5.4745	24.9943 ppm
		7.0385	24.9943

Lab Name: EOS
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 15:55:09
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-1A08.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



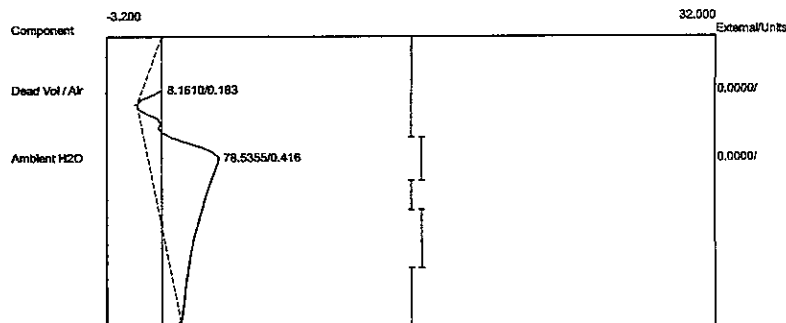
Component	Retention	Area	External Units
Dead Vol / Air	0.150	7.5810	0.0000
Ambient H2O	0.416	79.0520	0.0000
		86.6330	0.0000

LUD name: LUD1
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 16:00:10
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-1A09.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.250	1.3590	0.0000	
Ethylene Oxide	0.533	5.5385	25.2865	ppm
		6.8975	25.2865	

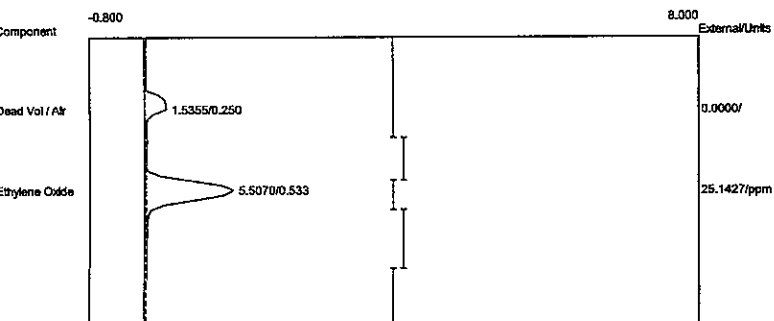
LUD name: LUD2
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 16:00:10
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-1A09.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



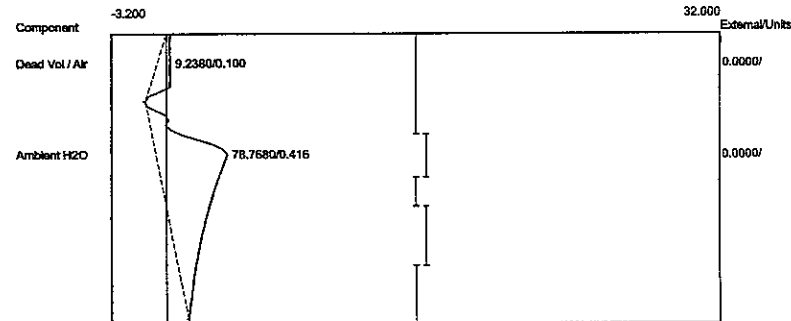
Component	Retention	Area	External	Units
Dead Vol / Air	0.183	8.1610	0.0000	
Ambient H2O	0.416	78.5355	0.0000	
		86.6965	0.0000	

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 16:05:16
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-1A10.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 16:05:16
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-1A10.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



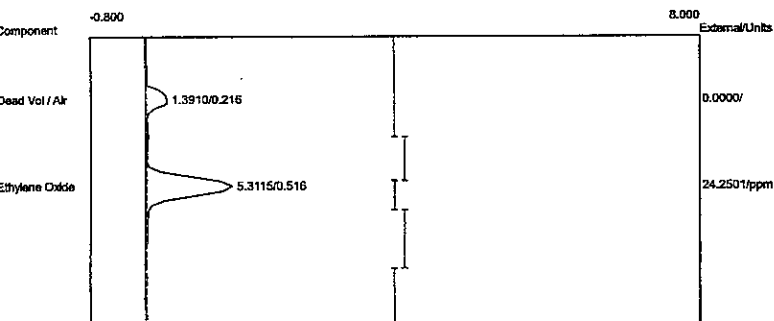
Component	Retention	Area	External Units
Dead Vol / Air	0.250	1.5355	0.0000
Ethylene Oxide	0.533	5.5070	25.1427 ppm
		7.0425	25.1427



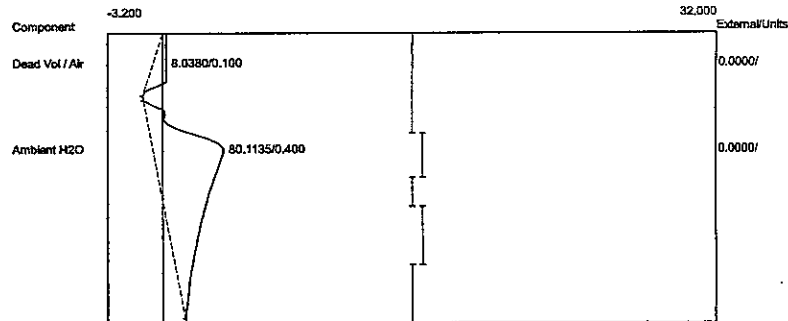
Component	Retention	Area	External Units
Dead Vol / Air	0.100	9.2380	0.0000
Ambient H2O	0.416	78.7680	0.0000
		88.0060	0.0000

Lab name: EUS
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 16:10:18
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-1A11.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer

Lab name: EUS
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 16:10:18
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-1A11.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer

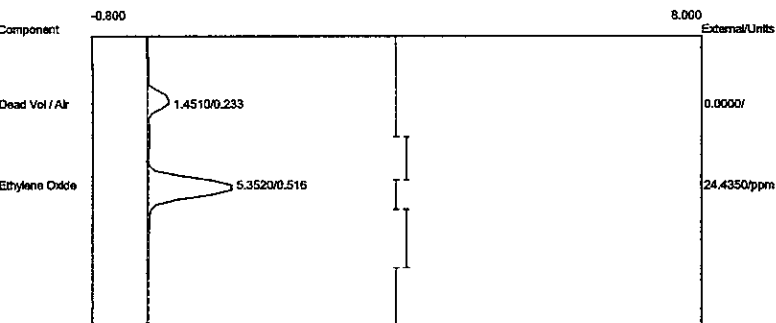


Component	Retention	Area	External Units
Dead Vol / Air	0.216	1.3910	0.0000
Ethylene Oxide	0.516	5.3115	24.2501 ppm
		6.7025	24.2501



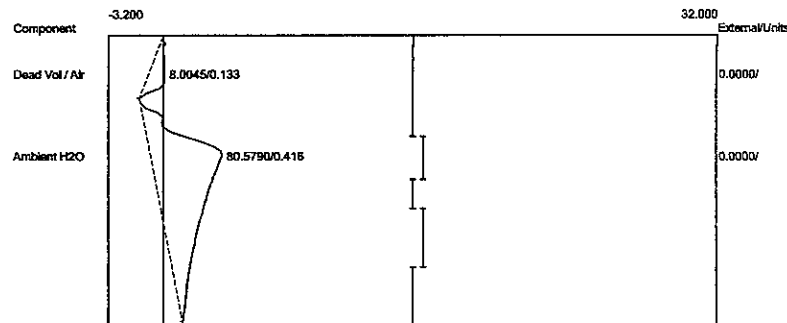
Component	Retention	Area	External Units
Dead Vol / Air	0.100	8.0380	0.0000
Ambient H2O	0.400	80.1135	0.0000
		88.1515	0.0000

Lab Name: EOB
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 16:15:17
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-1A12.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.4510	0.0000
Ethylene Oxide	0.516	5.3520	24.4350 ppm
		6.8030	24.4350

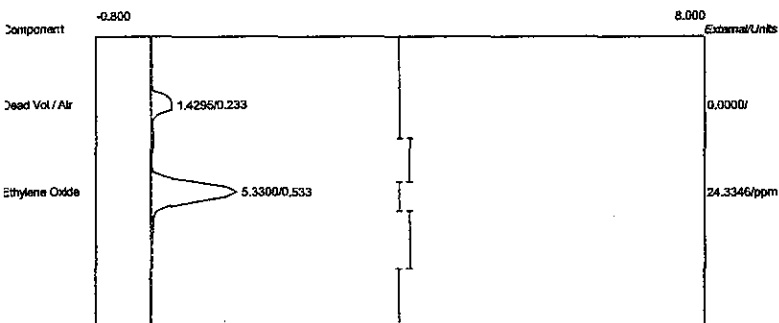
Lab Name: EOB
 Client: Sterigenics Ontario
 Client ID: Run#1Aer
 Analysis date: 10/13/2015 16:15:17
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-1A12.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



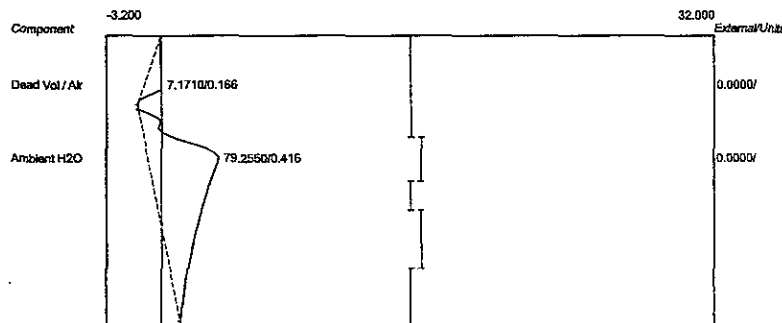
Component	Retention	Area	External Units
Dead Vol / Air	0.133	8.0045	0.0000
Ambient H2O	0.416	80.5790	0.0000
		88.5835	0.0000

Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 16:20:44
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-2A01.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer

Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 16:20:44
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-2A01.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer

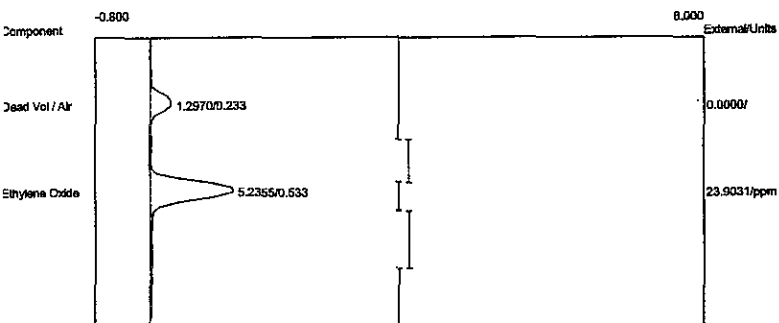


Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.4295	0.0000
Ethylene Oxide	0.533	5.3300	24.3346 ppm
		6.7595	24.3346



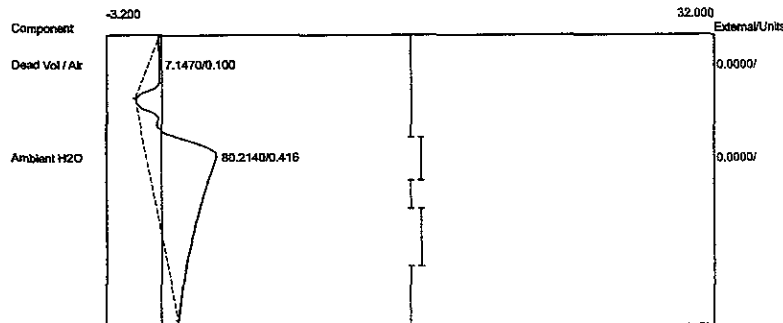
Component	Retention	Area	External Units
Dead Vol / Air	0.166	7.1710	0.0000
Ambient H2O	0.416	79.2550	0.0000
		86.4260	0.0000

Lab Name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 16:25:53
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-2A02.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



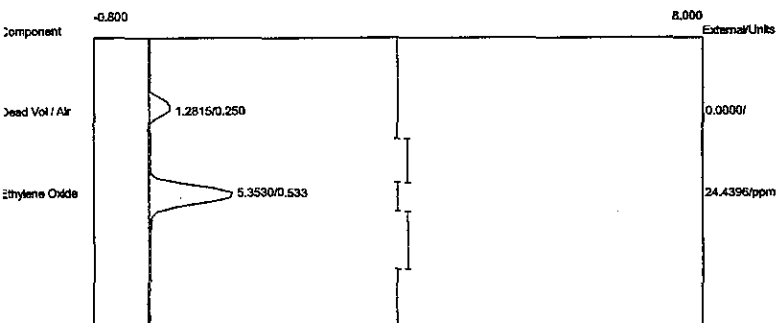
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.2970	0.0000	
Ethylene Oxide	0.533	5.2355	23.9031	ppm
		6.5325	23.9031	

Lab Name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 16:25:53
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-2A02.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



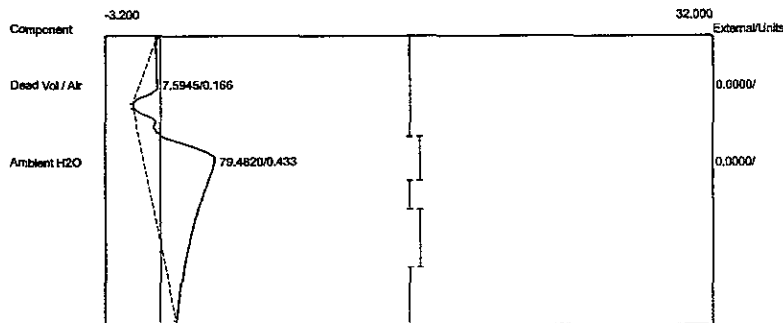
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	7.1470	0.0000	
Ambient H2O	0.416	80.2140	0.0000	
		87.3610	0.0000	

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 16:30:15
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carboxpack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-2A03.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



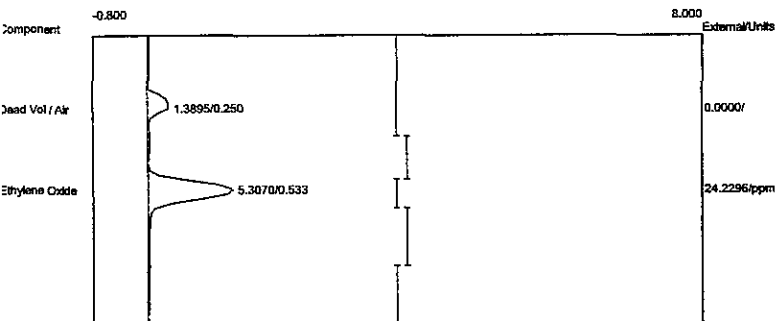
Component	Retention	Area	External Units
Dead Vol / Air	0.250	1.2815	0.0000
Ethylene Oxide	0.533	5.3530	24.4396 ppm
		6.6345	24.4396

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 16:30:15
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carboxpack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-2A03.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



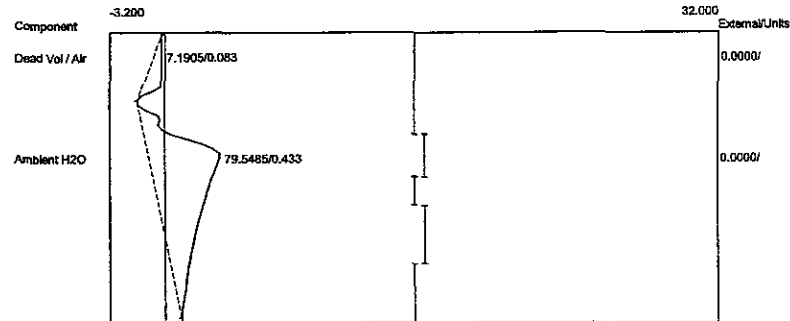
Component	Retention	Area	External Units
Dead Vol / Air	0.166	7.5945	0.0000
Ambient H2O	0.433	79.4820	0.0000
		87.0765	0.0000

Lab Name: ESO
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 16:35:10
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-2A04.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



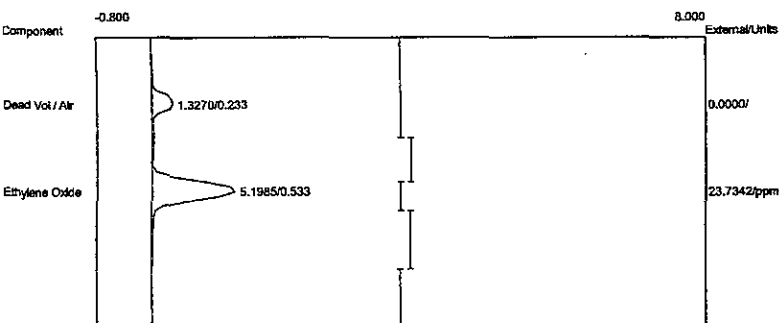
Component	Retention	Area	External Units
Dead Vol / Air	0.250	1.3895	0.0000
Ethylene Oxide	0.533	5.3070	24.2296 ppm
		6.6965	24.2296

Lab Name: ESO
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 16:35:10
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-2A04.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



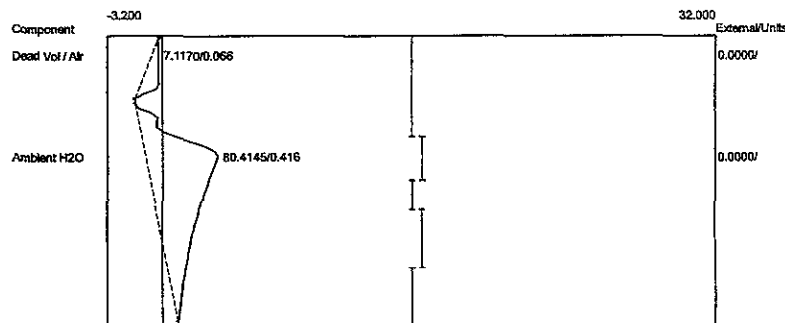
Component	Retention	Area	External Units
Dead Vol / Air	0.083	7.1905	0.0000
Ambient H2O	0.433	79.5485	0.0000
		86.7390	0.0000

Lab Name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 16:40:37
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-2A05.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



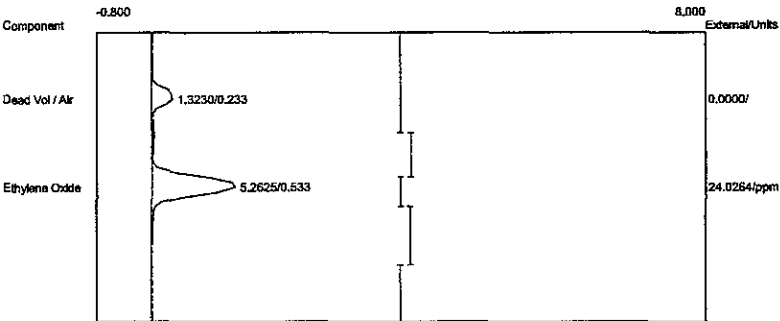
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.3270	0.0000
Ethylene Oxide	0.533	5.1985	23.7342 ppm
		6.5255	23.7342

Lab Name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 16:40:37
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-2A05.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



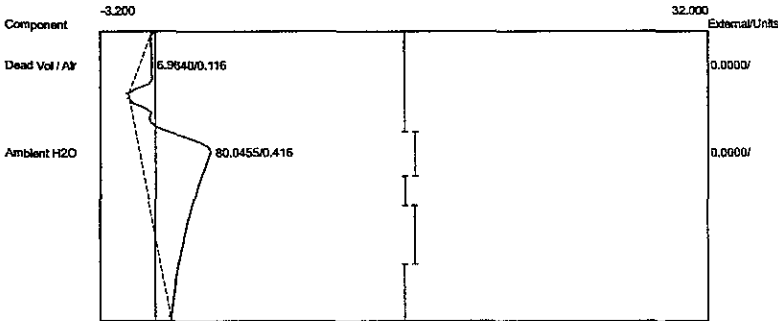
Component	Retention	Area	External Units
Dead Vol / Air	0.066	7.1170	0.0000
Ambient H2O	0.416	80.4145	0.0000
		87.5315	0.0000

Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 16:45:12
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-2A06.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



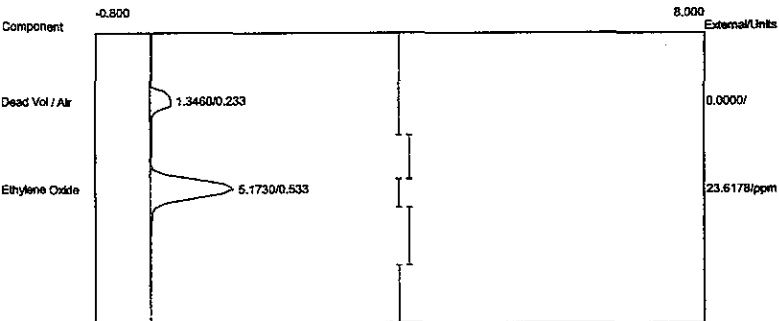
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.3230	0.0000
Ethylene Oxide	0.533	5.2625	24.0264 ppm
		6.5855	24.0264

Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 16:45:12
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-2A06.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



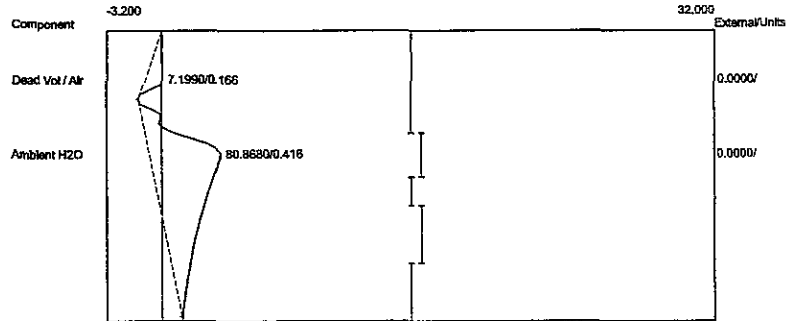
Component	Retention	Area	External Units
Dead Vol / Air	0.116	6.9640	0.0000
Ambient H2O	0.416	80.0455	0.0000
		87.0095	0.0000

Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 16:50:44
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-2A07.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



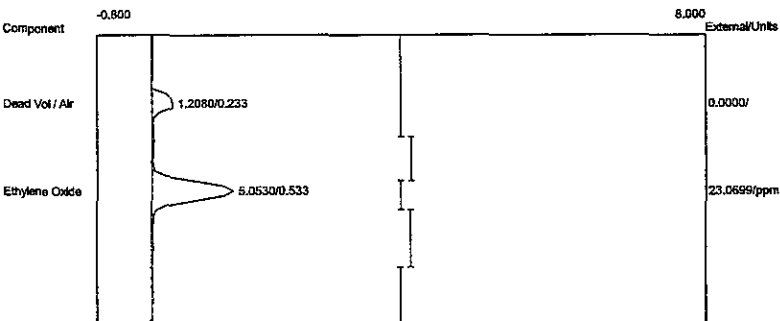
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.3460	0.0000
Ethylene Oxide	0.533	5.1730	23.6178 ppm
		6.5190	23.6178

Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 16:50:44
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-2A07.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



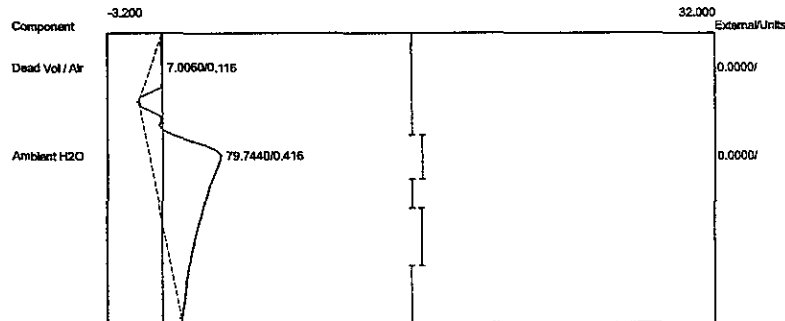
Component	Retention	Area	External Units
Dead Vol / Air	0.166	7.1990	0.0000
Ambient H2O	0.416	80.8680	0.0000
		88.0670	0.0000

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 16:55:05
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-2A08.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



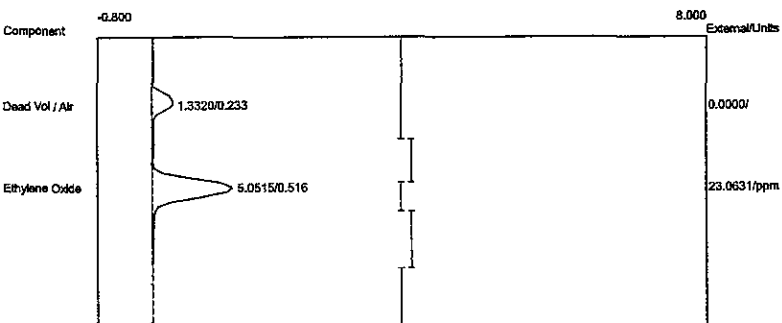
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.2080	0.0000	
Ethylene Oxide	0.533	5.0530	23.0699	ppm
		6.2610	23.0699	

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 16:55:05
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-2A08.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



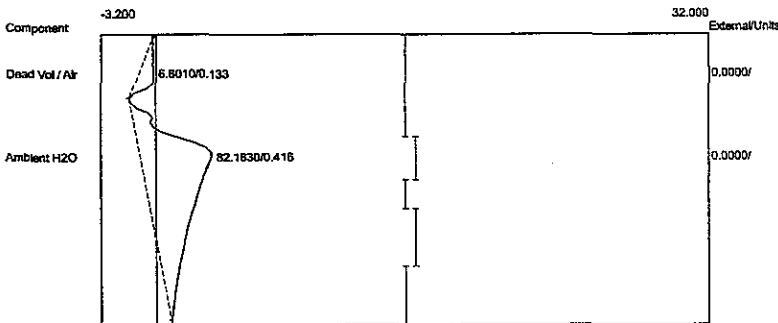
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	7.0060	0.0000	
Ambient H2O	0.416	79.7440	0.0000	
		86.7500	0.0000	

Lab Name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 17:00:32
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-2A09.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



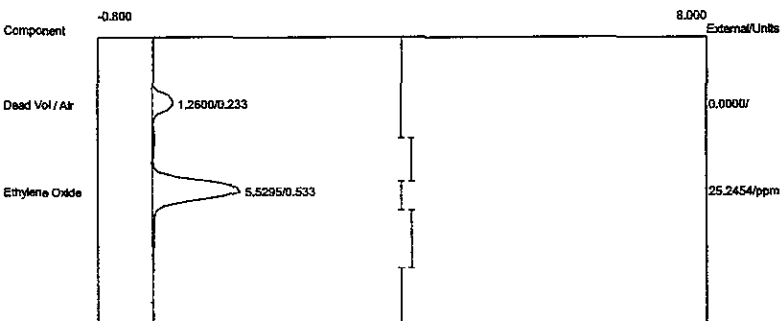
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.3320	0.0000
Ethylene Oxide	0.516	5.0515	23.0631 ppm
		6.3835	23.0631

Lab Name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 17:00:32
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-2A09.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



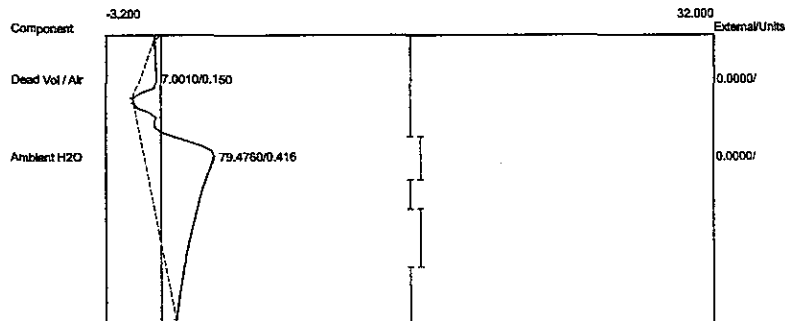
Component	Retention	Area	External Units
Dead Vol / Air	0.133	6.8010	0.0000
Ambient H2O	0.416	82.1830	0.0000
		88.9840	0.0000

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 17:05:14
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-2A10.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



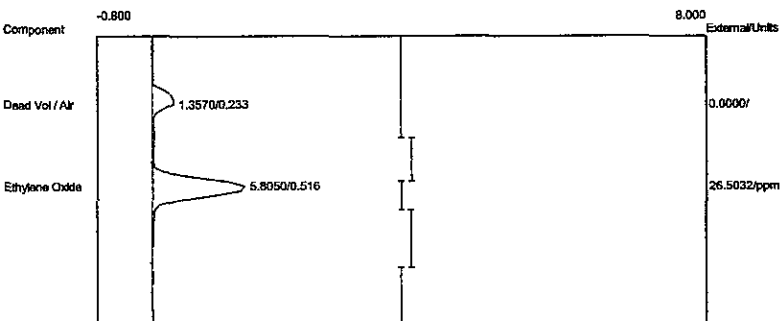
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.2600	0.0000
Ethylene Oxide	0.533	5.5295	25.2454 ppm
		6.7895	25.2454

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 17:05:14
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-2A10.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



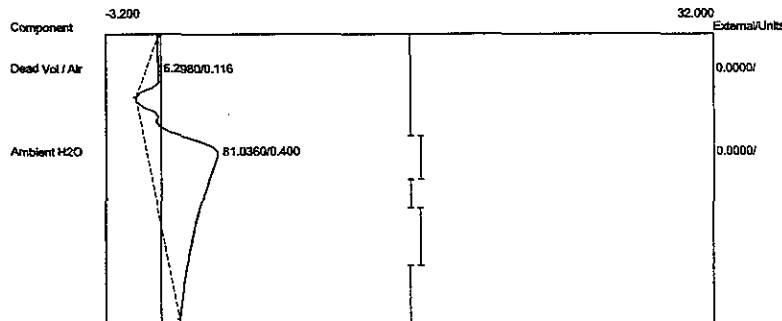
Component	Retention	Area	External Units
Dead Vol / Air	0.150	7.0010	0.0000
Ambient H2O	0.416	79.4760	0.0000
		86.4770	0.0000

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 17:10:26
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-2A11.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



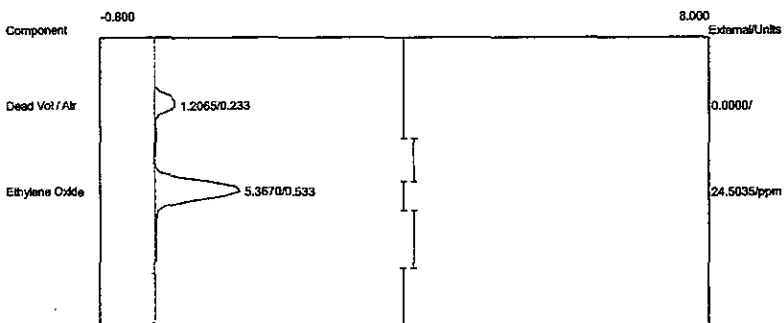
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.3570	0.0000
Ethylene Oxide	0.516	5.8050	26.5032 ppm
		7.1620	26.5032

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 17:10:26
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-2A11.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



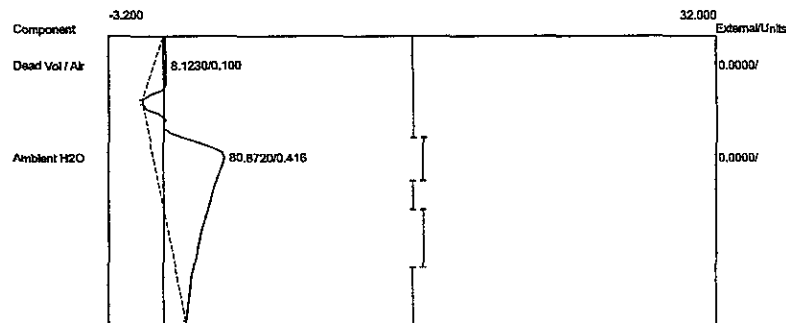
Component	Retention	Area	External Units
Dead Vol / Air	0.116	6.2980	0.0000
Ambient H2O	0.400	81.0360	0.0000
		87.3340	0.0000

Lab Name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 17:15:14
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-2A12.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.2065	0.0000
Ethylene Oxide	0.533	5.3670	24.5035 ppm
		6.5735	24.5035

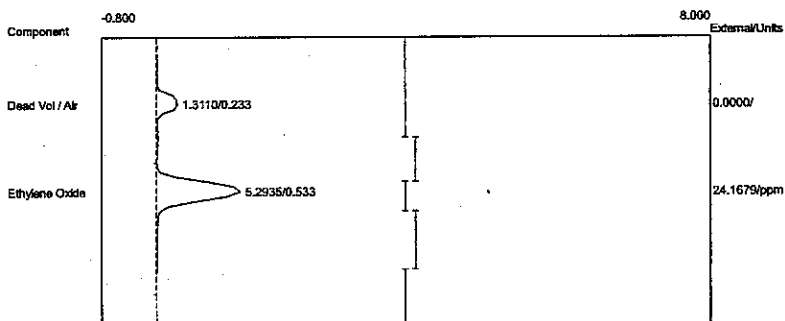
Lab Name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#2Aer
 Analysis date: 10/13/2015 17:15:14
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-2A12.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



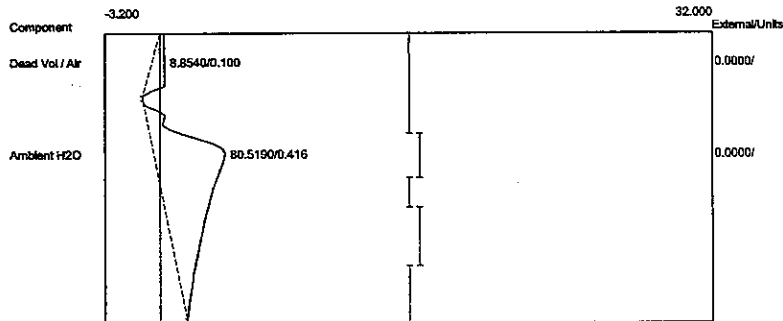
Component	Retention	Area	External Units
Dead Vol / Air	0.100	8.1230	0.0000
Ambient H2O	0.416	80.8720	0.0000
		88.9950	0.0000

Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 17:20:19
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-3A01.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer

Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 17:20:19
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-3A01.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer

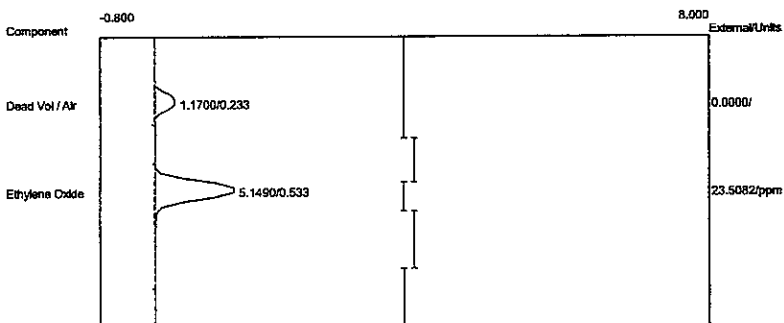


Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.3110	0.0000
Ethylene Oxide	0.533	5.2935	24.1679 ppm
		6.6045	24.1679



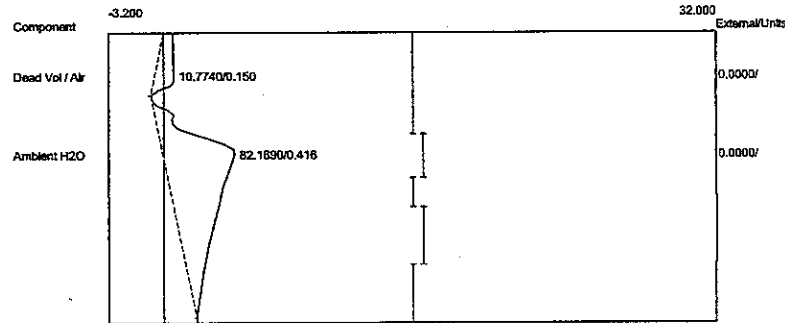
Component	Retention	Area	External Units
Dead Vol / Air	0.100	8.8540	0.0000
Ambient H2O	0.416	80.5190	0.0000
		89.3730	0.0000

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 17:25:03
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-3A02.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



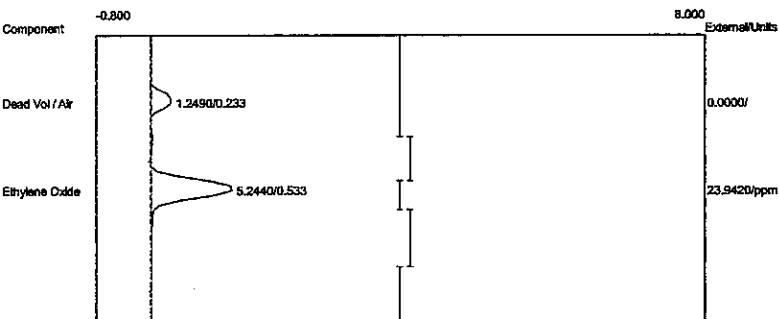
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.1700	0.0000
Ethylene Oxide	0.533	5.1490	23.5082 ppm
		6.3190	23.5082

Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 17:25:03
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-3A02.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



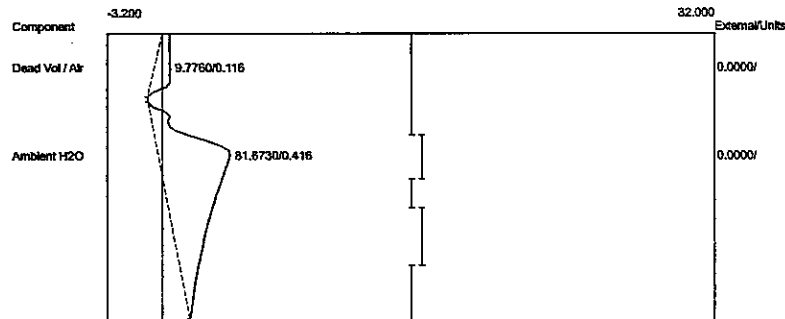
Component	Retention	Area	External Units
Dead Vol / Air	0.150	10.7740	0.0000
Ambient H2O	0.416	82.1690	0.0000
		92.9430	0.0000

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 17:30:17
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbowack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-3A03.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



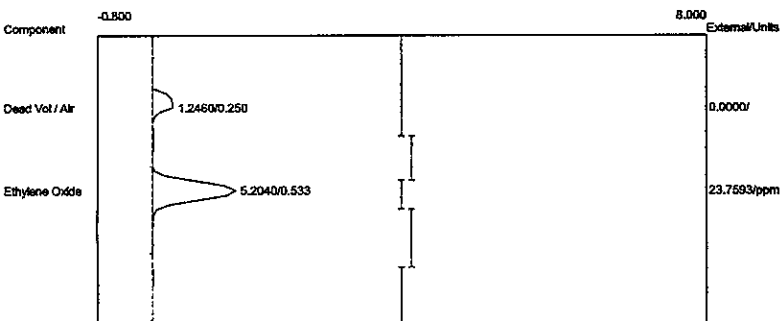
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.2490	0.0000
Ethylene Oxide	0.533	5.2440	23.9420 ppm
		6.4930	23.9420

Lab name: EOC
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 17:30:17
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbowack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-3A03.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



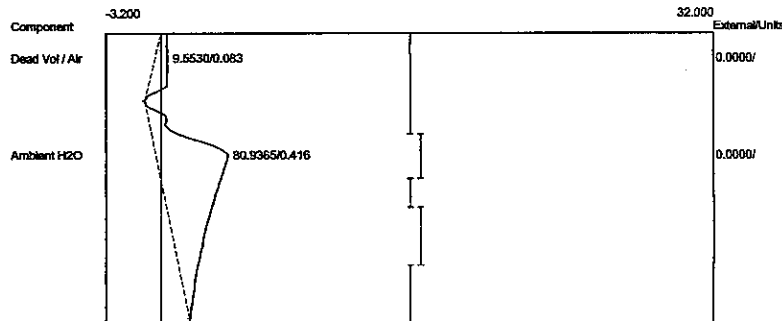
Component	Retention	Area	External Units
Dead Vol / Air	0.116	9.7760	0.0000
Ambient H2O	0.416	81.6730	0.0000
		91.4490	0.0000

Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 17:35:32
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-3A04.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



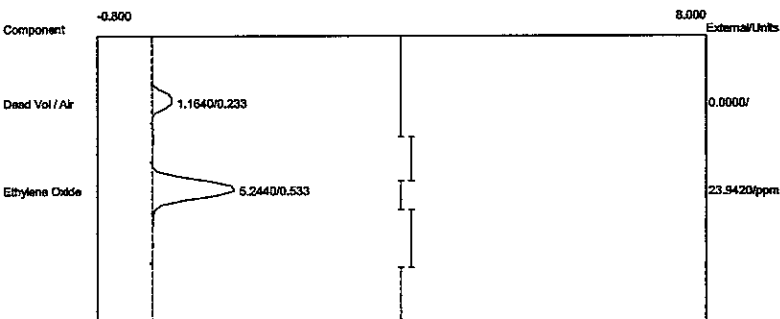
Component	Retention	Area	External Units
Dead Vol / Air	0.250	1.2460	0.0000
Ethylene Oxide	0.533	5.2040	23.7593 ppm
		6.4500	23.7593

Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 17:35:32
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-3A04.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



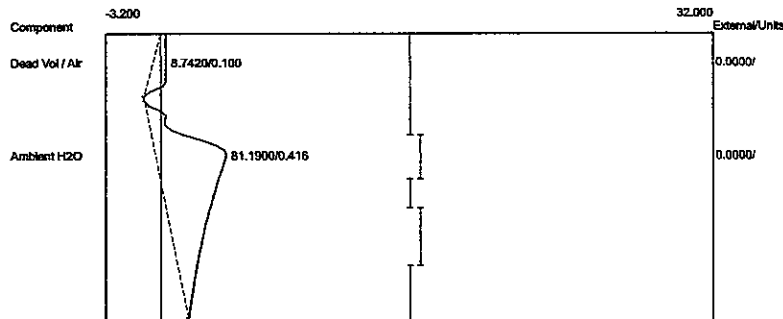
Component	Retention	Area	External Units
Dead Vol / Air	0.083	9.5530	0.0000
Ambient H2O	0.416	80.9365	0.0000
		90.4895	0.0000

Lab name: ECS
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 17:40:10
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-3A05.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



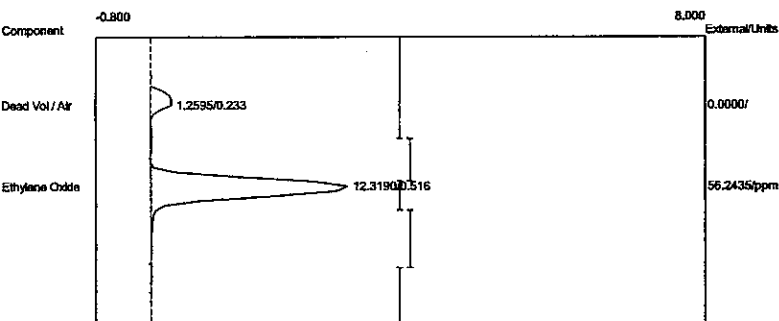
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.1640	0.0000
Ethylene Oxide	0.533	5.2440	23.9420 ppm
		6.4080	23.9420

Lab name: ECS
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 17:40:10
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-3A05.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



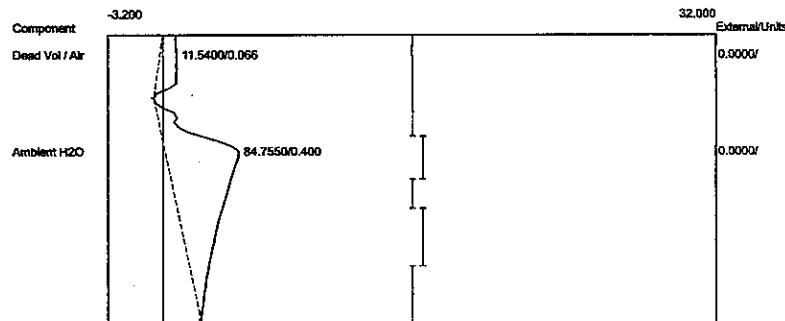
Component	Retention	Area	External Units
Dead Vol / Air	0.100	8.7420	0.0000
Ambient H2O	0.416	81.1900	0.0000
		89.9320	0.0000

Lab name: ECSI
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 17:45:11
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-3A06.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



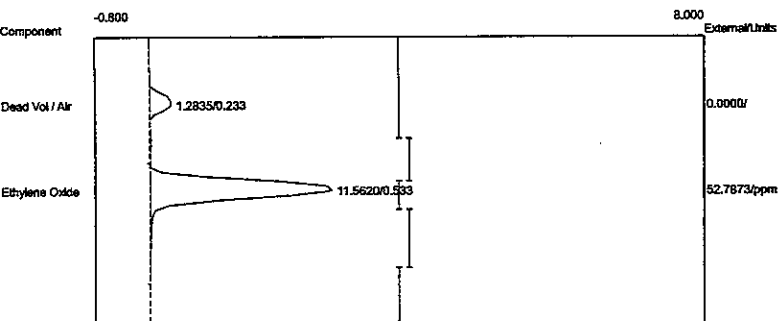
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.2595	0.0000
Ethylene Oxide	0.516	12.3190	56.2435 ppm
		13.5785	56.2435

Lab name: ECSI
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 17:45:11
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-3A06.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



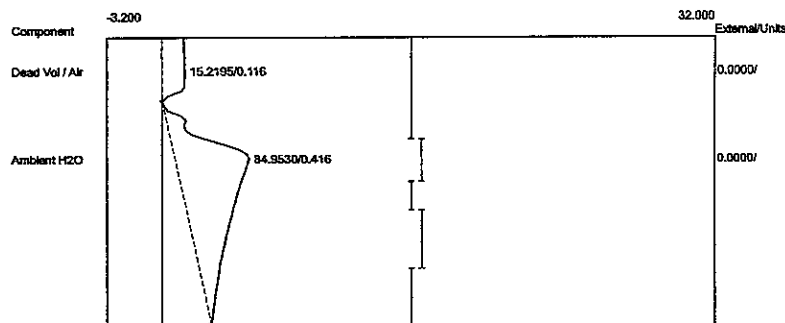
Component	Retention	Area	External Units
Dead Vol / Air	0.066	11.5400	0.0000
Ambient H2O	0.400	84.7550	0.0000
		96.2950	0.0000

Lab name: ECS
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 17:51:14
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-3A07.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.2835	0.0000
Ethylene Oxide	0.533	11.5620	52.7873 ppm
		12.8455	52.7873

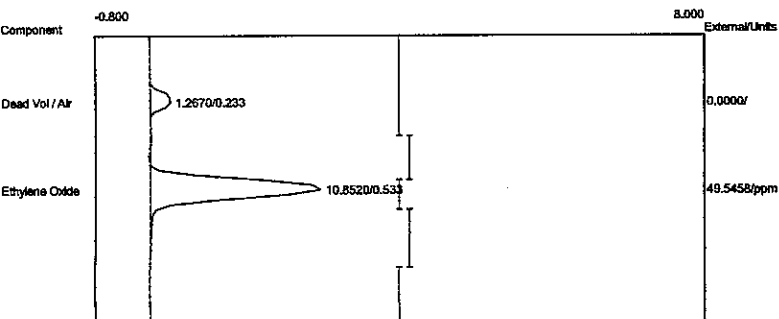
Lab name: ECS
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 17:51:14
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-3A07.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



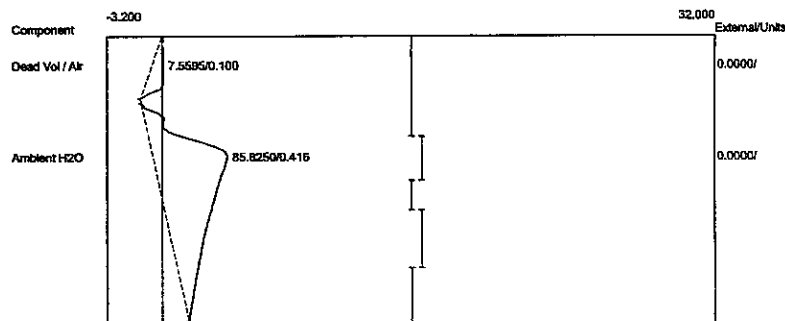
Component	Retention	Area	External Units
Dead Vol / Air	0.116	15.2195	0.0000
Ambient H2O	0.416	84.9530	0.0000
		100.1725	0.0000

Lab name: ECSI
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 17:55:08
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carboxpack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-3A08.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer

Lab name: ECSI
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 17:55:08
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carboxpack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-3A08.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer

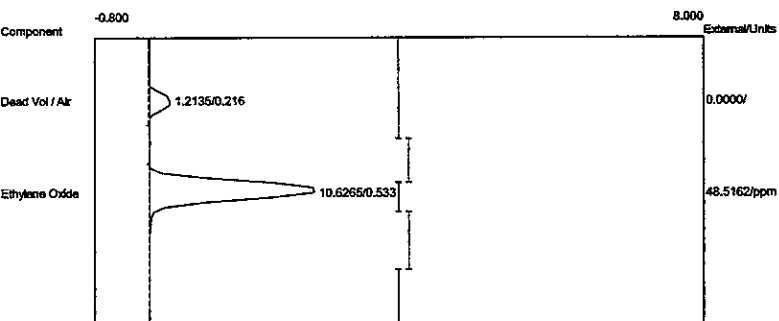


Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.2670	0.0000
Ethylene Oxide	0.533	10.8520	49.5458 ppm
		12.1190	49.5458



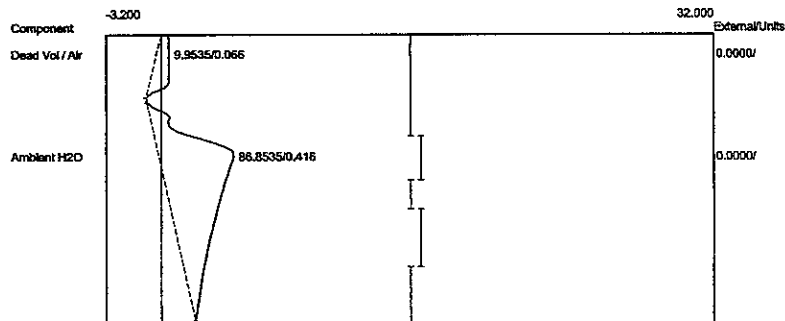
Component	Retention	Area	External Units
Dead Vol / Air	0.100	7.5595	0.0000
Ambient H2O	0.416	85.8250	0.0000
		93.3845	0.0000

Lab name: EOS
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 18:00:03
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-3A09.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



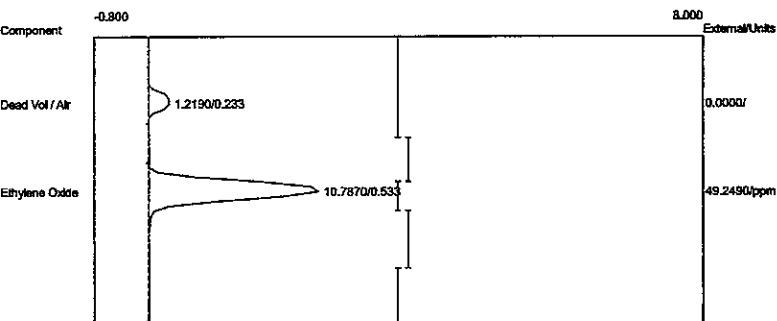
Component	Retention	Area	External Units
Dead Vol / Air	0.216	1.2135	0.0000
Ethylene Oxide	0.533	10.6265	48.5162 ppm
		11.8400	48.5162

Lab name: EOS
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 18:00:03
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-3A09.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



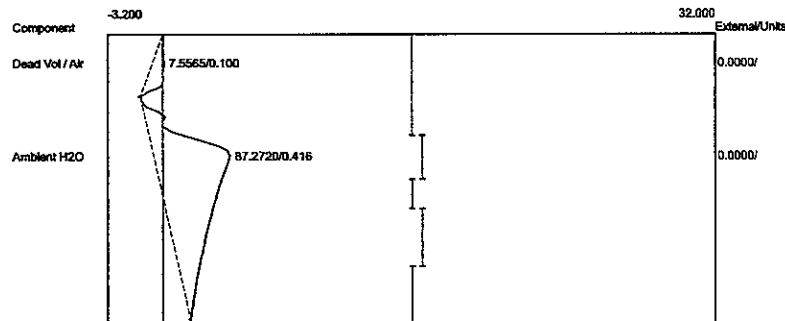
Component	Retention	Area	External Units
Dead Vol / Air	0.066	9.9535	0.0000
Ambient H2O	0.416	86.8535	0.0000
		96.8070	0.0000

Lab Name: ECSI
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 18:05:18
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbowack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-3A10.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



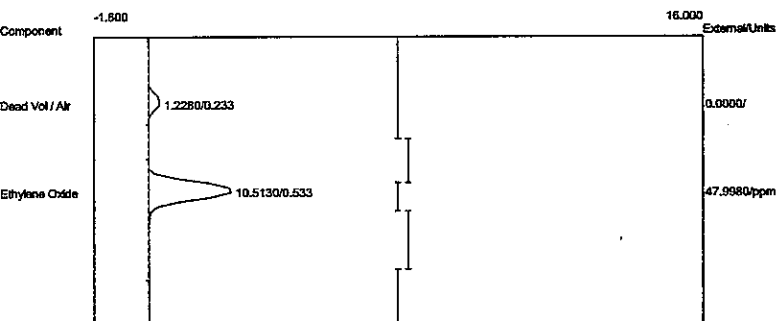
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.2190	0.0000
Ethylene Oxide	0.533	10.7870	49.2490 ppm
		12.0060	49.2490

Lab Name: ECSI
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 18:05:18
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbowack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-3A10.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



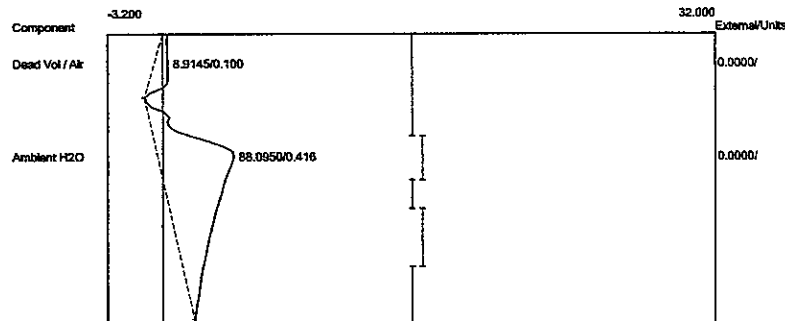
Component	Retention	Area	External Units
Dead Vol / Air	0.100	7.5565	0.0000
Ambient H2O	0.416	87.2720	0.0000
		94.8285	0.0000

Lab name: ECS
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 18:10:06
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carboxpack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-3A11.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



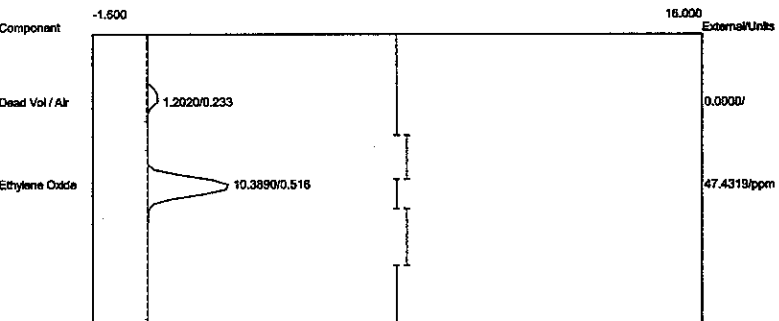
Component	Retention	Area	External Units
Dead Vol / Air	0.233	1.2280	0.0000
Ethylene Oxide	0.533	10.5130	47.9980 ppm
		11.7410	47.9980

Lab name: ECS
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 18:10:06
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carboxpack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-3A11.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



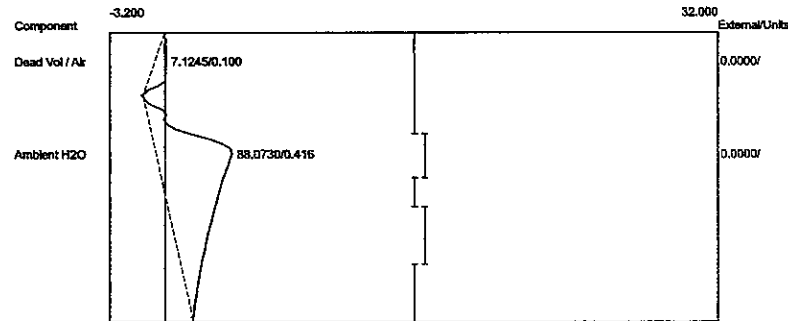
Component	Retention	Area	External Units
Dead Vol / Air	0.100	8.9145	0.0000
Ambient H2O	0.416	88.0950	0.0000
		97.0095	0.0000

Lab Name: ESO
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 18:15:03
 Method: Direct Injection
 Description: CHANNEL 1 - FID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto1-100.cpt
 Data file: 1SterOnt2015-3A12.CHR (c:\peak359)
 Sample: Abator Inlet
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.2020	0.0000	
Ethylene Oxide	0.516	10.3890	47.4319	ppm
		11.5910	47.4319	

Lab Name: ESO
 Client: Sterigenics Ontario
 Client ID: Run#3Aer
 Analysis date: 10/13/2015 18:15:03
 Method: Direct Injection
 Description: CHANNEL 2 - PID
 Column: 1% SP-1000, Carbopack B
 Carrier: HELIUM
 Temp. prog: eto-100.tem
 Components: eto2-100.cpt
 Data file: 2SterOnt2015-3A12.CHR (c:\peak359)
 Sample: Abator Outlet
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	7.1245	0.0000	
Ambient H2O	0.416	88.0730	0.0000	
		95.1975	0.0000	

APPENDIX D

Field Data and Calculation Worksheets

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Sterigenics, Inc. - Ontario, California

10-13-15 - Backvent Test Data

<u>DeltaP</u>	<u>SqRtDeltaP</u>	<u>Stack Temp (F)</u>	<u>ppm EtO</u>	<u>Catalyst Temp</u>		
0.14	0.3742	224	0.01	311	mw =	28.51
0.14	0.3742	224	0.01	311	stack area =	15.9
0.14	0.3742	224	0.01	311	press =	28.95
0.14	0.3742	223	0.01	310	Tstd =	528
0.14	0.3742	225	0.01	312	Pstd =	29.92
0.14	0.3742	225	0.01	312	Cp =	0.99
0.14	0.3742	223	0.01	310	Kp =	85.49
0.14	0.3742	223	0.01	310	Velocity =	28.8 ft/sec
0.14	0.3742	224	0.01	311	Flow =	19922 dscfm
0.14	0.3742	225	0.01	312	MWeto =	44.05
0.14	0.3742	225	0.01	312	MolVol =	385.32
0.14	0.3742	225	0.01	312	ppmv/ft3 =	1000000
0.14	0.3742	225	0.01	312		
Average =					EtO Mass Flow =	0.0000228 lbs/min
0.14	0.3742	224.2	0.0100	311.2	EtO Mass Flow =	0.001366 lbs/hr
		= 684	degR			

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Sterigenics, Inc. - Ontario, California

10-13-15 - Aeration Test Data

<u>DeltaP</u>	<u>SqRtDeltaP</u>	<u>Stack Temp (F)</u>	<u>ppm EtO</u>	<u>Catalyst Temp</u>		
Run#1					mw =	28.51
0.14	0.3742	224	0.01	311	stack area =	15.9
0.14	0.3742	225	0.01	312	press =	28.95
0.14	0.3742	225	0.01	312	Tstd =	528
0.14	0.3742	224	0.01	311	Pstd =	29.92
0.14	0.3742	225	0.01	312	Cp =	0.99
0.14	0.3742	225	0.01	312	Kp =	85.49
0.14	0.3742	226	0.01	313	Velocity =	28.8 ft/sec
0.14	0.3742	224	0.01	311	Flow =	19924 dscfm
0.14	0.3742	223	0.01	310		
0.14	0.3742	224	0.01	311	MWeto =	44.05
0.14	0.3742	223	0.01	310	MolVol =	385.32
0.14	0.3742	224	0.01	311	ppmv/ft3 =	1000000
Run#2						
0.14	0.3742	224	0.01	311	EtO Mass Flow =	0.0000228 lbs/min
0.14	0.3742	224	0.01	311	EtO Mass Flow =	0.001367 lbs/hr
0.14	0.3742	224	0.01	311		
0.14	0.3742	225	0.01	312		
0.14	0.3742	225	0.01	312		
0.14	0.3742	224	0.01	311		
0.14	0.3742	224	0.01	311		
0.14	0.3742	226	0.01	313		
0.14	0.3742	224	0.01	311		
0.14	0.3742	224	0.01	311		
0.14	0.3742	222	0.01	309		
0.14	0.3742	222	0.01	309		
Run#3						
0.14	0.3742	222	0.01	309		
0.14	0.3742	223	0.01	310		
0.14	0.3742	223	0.01	310		
0.14	0.3742	223	0.01	310		
0.14	0.3742	224	0.01	311		
0.14	0.3742	225	0.01	312		
0.14	0.3742	223	0.01	310		
0.14	0.3742	224	0.01	311		
0.14	0.3742	225	0.01	312		
0.14	0.3742	225	0.01	312		
0.14	0.3742	225	0.01	312		
0.14	0.3742	224	0.01	311		
Average =						
0.14	0.3742	224.1	0.0100	311.1		
		= 684	degR			

APPENDIX E
Gas Certifications



Scott Specialty Gases

2600 CAJON BLVD., SAN BERNARDINO, CA 92411

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information

Project No.: 02-57164-001
Item No.: 02020001310TCL
P.O. No.: VBL - D KREMER

Cylinder Number: CAL4448
Cylinder Size: CL
Certification Date: 14Apr2014

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name

ETHYLENE OXIDE
NITROGEN

**Concentration
(Moles)**

1.10 PPM
BALANCE

**Accuracy
(+/-%)**

5

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY:


MT

DATE: 4-14-14



Scott Specialty Gases

2800 CAJON BLVD., SAN BERNARDINO, CA 92411

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information

Project No.: 02-57164-003
Item No.: 02020001320TCL
P.O. No.: VBL - D. KREMER

Cylinder Number: CLM003232
Cylinder Size: CL
Certification Date: 14Apr2014

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name

ETHYLENE OXIDE
NITROGEN

**Concentration
(Moles)**

10.1 PPM
BALANCE

**Accuracy
(+/-%)**

5

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY:

MT

DATE: 4-14-14



Scott Specialty Gases

2800 CAJON BLVD., SAN BERNARDINO, CA 92411

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Phone: 909-887-2571 Fax: 909 887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information

Project No.: 02-57184-004
Item No.: 02020001330TCL
P.O. No.: VBL - D. KREMER

Cylinder Number: CLM011385
Cylinder Size: CL
Certification Date: 14Apr2014

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name

ETHYLENE OXIDE
NITROGEN

**Concentration
(Moles)**

100. PPM
BALANCE

**Accuracy
(+/-%)**

5

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY:

B. McCall
BLM

DATE:

4-14-14



Scott Specialty Gases

2600 CAJON BLVD., SAN BERNARDINO, CA 92411

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Phone: 909 887 2571 Fax: 909-887-0649

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information

Project No.: 02-57164-006
Item No.: 02020001340TCL
P.O. No.: VBL-D. KREMER

Cylinder Number: CLM002810
Cylinder Size: CL
Certification Date: 14Apr2014

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name

ETHYLENE OXIDE
NITROGEN

Concentration
(Moles)

1.000. PPM
BALANCE

Accuracy
(+/-%)

5

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY:


BLM

DATE: 4-14-14



Scott Specialty Gases

2600 CAJON BLVD., SAN BERNARDINO, CA 92411

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information

Project No.: 02-57164-006
Item No.: 02020001340TCL
P.O. No.: VBL-D. KREMER

Cylinder Number: CLM005787
Cylinder Size: CL
Certification Date: 14Apr2014

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

<u>Component Name</u>	<u>Concentration (Moles)</u>	<u>Accuracy (+/-%)</u>
ETHYLENE OXIDE NITROGEN	10,080. PPM BALANCE	5

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY:

B. M. Kelly
BLM

DATE: 4-14-14

CERTIFICATE OF ANALYSIS

Customer Name:	ECSI, Inc.	Cylinder Number:	SA25925
Stock or Analyzer Tag Number:	N/A	Product Class:	Certified Standard
Customer Reference:	Verbal- Dan	Cylinder - Contents¹:	28 CF @ 2000 PSI
MESA Reference:	104448	Cylinder-CGA:	A006-11P-BR 350
Date of Certification:	4/15/2014	Analysis Method:	GC-TCD FID
Recommended Shelf Life:	2 Years	Preparation Method:	Gravimetric

Component	Requested Concentration ²	Reported Concentration ^{2,3}
Ethylene Oxide	50 ppm	48.8 ppm
Nitrogen	Balance	Balance

Authorized Signature: _____

- The fill pressure shown on the CTA is as originally quoted. The fill pressure measured by the customer may differ from the fill pressure originally quoted due to temperature effects, compressibility of the individual components when blended together in the cylinder, gauge accuracy or reduction in content volume before shipping as a result of samples withdrawn for laboratory use, necessary to ensure product quality.
- Unless otherwise stated, concentrations are given in molar units.
- Vapor pressure mixes are blended at a sufficiently low pressure so as to eliminate phase separation under most low temperature conditions encountered during transport or storage. However, it is generally recommended that cylinders containing vapor pressure restricted mixes be placed on the floor in a horizontal position and rolled back and forth to improve homogeneity of the gas phase mixture before being put into service.

Analytical Gas Standards are prepared and analyzed using combinations of NIST traceable weights, NISTs provided by NIST, or internal gas standards that have been verified for accuracy using procedures published by the NIST. Pure gases are analyzed and certified for purity using minor component Analytical Gas Standards prepared according to the methods specified above. Balances are calibrated to NIST test weights covered by NIST test number 822.356178.06. Reference Certification #s: 163 W, 830 N and 3260. Calibration methods are in conformance with NIST 881145662A.

MESA Specialty Gases & Equipment

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 On-line Catalog at: www.mesagas.com